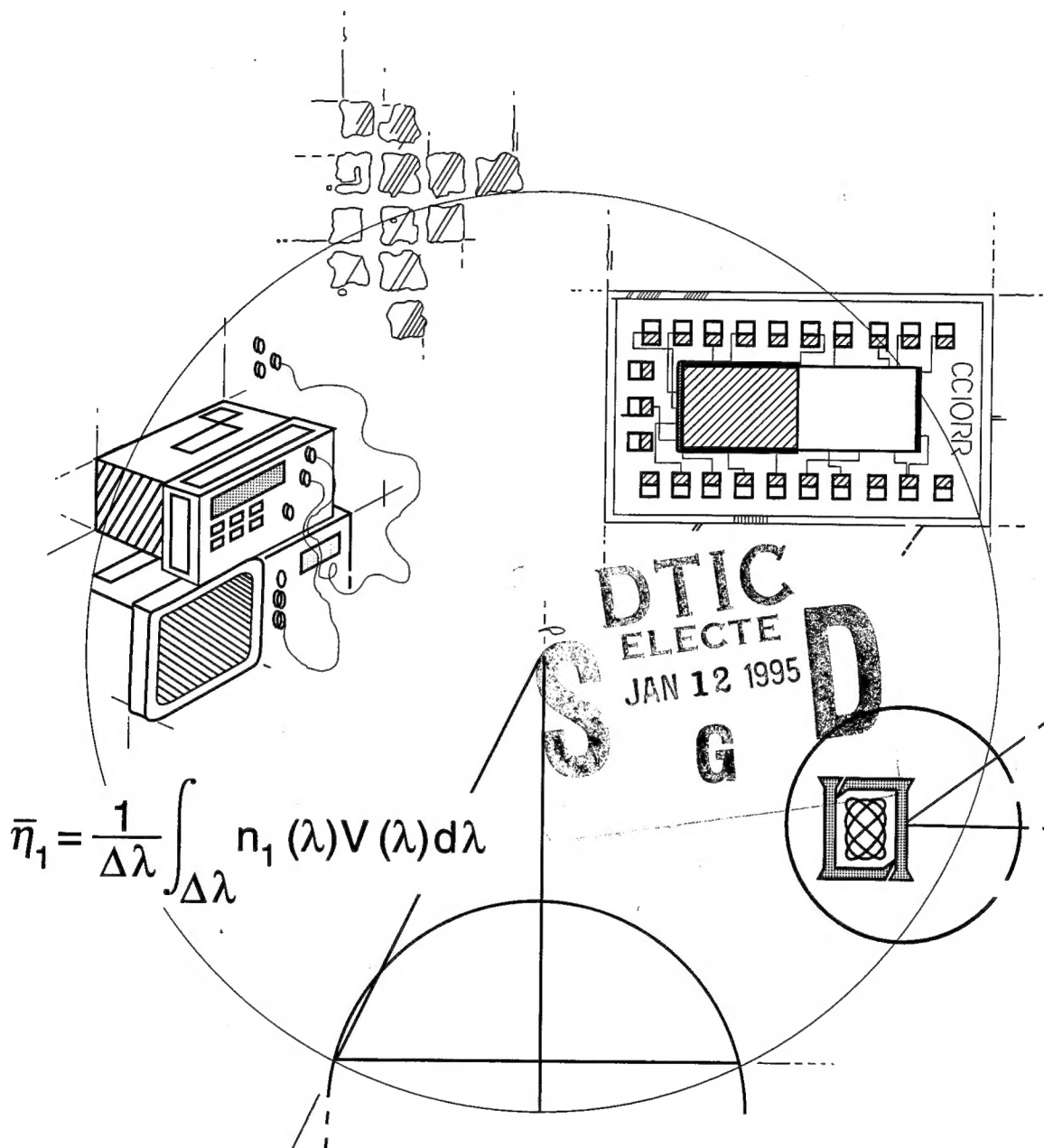


Bibliography of Patents and Licenses 1951-1990



$$\bar{n}_1 = \frac{1}{\Delta\lambda} \int_{\Delta\lambda} n_1(\lambda) V(\lambda) d\lambda$$

DTIC
ELECTE
JAN 12 1995

19950109 073



*Massachusetts Institute
of Technology
Lincoln Laboratory*

DTIC QUALITY INSPECTED 1

DISTRIBUTION STATEMENT A

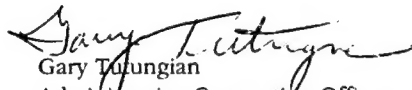
Approved for public release;
Distribution Unlimited

This report is based on studies performed at Lincoln Laboratory, a center for research operated by Massachusetts Institute of Technology. The work was sponsored by the Department of the Air Force under Contract F19628-90-C-0002.

This report may be reproduced to satisfy needs of U.S. Government agencies.

The ESC Public Affairs Office has reviewed this report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

FOR THE COMMANDER


Gary Tufungian
Administrative Contracting Officer
Contracted Support Management

Non-Lincoln Recipients

PLEASE DO NOT RETURN

Permission is given to destroy this document
when it is no longer needed.

BIBLIOGRAPHY OF PATENTS AND LICENSES
ISSUED TO
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
LINCOLN LABORATORY
1951 - 1990

Prepared by Group 17
Library and Information Services

Accession For	
NTIS CRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

INTRODUCTION

Since its establishment in 1951, MIT Lincoln Laboratory has actively pursued its mission to "carry out a program of research and development pertinent to national defense with particular emphasis on advanced electronics." Toward this end, the Laboratory promotes scientific and technological research providing the best solutions to address the needs of the nation. By patenting and licensing inventions, technology originally developed to meet the specific needs of the Department of Defense and other government agencies can be applied to solve problems in the civilian sector; this substantially benefits the nation's economy and serves as an impetus for improving society worldwide.

EXECUTIVE SUMMARY

Massachusetts Institute of Technology maintains close ties with industry to enhance both the vitality and relevance of its education and research. This steady flow of ideas between the Institute and the commercial world has established the Institute and Lincoln Laboratory as global leaders in technological competitiveness. For instance, the Laboratory has had a major role in developing diode laser technology for numerous military and civilian applications. Particularly significant has been the development of 1.3-1.5 μm diode lasers, which are now widely used as sources in fiber communications. The Laboratory has contributed significant advances in the areas of radar, physics, electronics, aerospace technology, new materials, communications, optics, lasers, solid state physics, artificial intelligence, neural networks, photovoltaics, superconductivity, semiconductors, health care, and computer hardware and software development; noteworthy contributions have also been made in the fields of air traffic control, environmental science, and solar energy.

Lincoln Laboratory's professional staff of approximately 1,200 members exemplifies the creativity, imagination, and innovation that has generated about seven invention disclosures each month. Eighty-five percent of the professional staff hold advanced degrees, two-thirds of which are in electrical engineering and physics disciplines, with others in diversified scientific fields and subject areas. Their breadth of education, skills, and experience meet the demands of sponsors' changing needs and the challenge to further an integrated approach in solving complex problems.

Since 1951, Lincoln Laboratory has effectively transferred its technology to industry, patenting 243 inventions, 69 of which are licensed, together generating over \$21 million. Many of these inventions have been protected worldwide. Moreover, some inventions, like the Solid State Laser of Dr. Aram Mooradian and the Diffractive/Refractive Lens Implant of Dr. Gary J. Swanson (see Selected Profiles in Creativity), can be considered breakthroughs that will bring about the creation of new industries, ensuring Lincoln Laboratory leadership in the scientific and technical communities.

In addition, a large number of "spin-off" companies have been started with Lincoln-developed technology. An example is Digital Equipment Corporation (DEC), founded in 1957 by Kenneth H. Olsen using technology developed at the Laboratory; DEC recently reported an annual sales figure of \$12.741 billion and a work force of 124,500 employees worldwide. Another example is Lasertron, begun in 1980, which has a reported \$22 million in sales with 230 employees. These are examples of companies that have made effective use of the potential of the Laboratory's research. In fact, Lincoln has an impressive number of spin-off companies: over the years, 63 have been spawned, employing more than 135,000 people and generating more than \$14.1 billion in sales annually.¹

Besides patents, Lincoln Laboratory promotes and furthers the intellectual and economic robustness of the country in several significant ways. Over the years, Laboratory researchers have authored over 60 books and each year they produce more than 500 journal articles, technical presentations at national and international conferences, and technical reports on a variety of topics in many fields.² In 1988, the *LINCOLN LABORATORY JOURNAL* was launched; this publication is distributed to almost 6,000 persons, agencies, institutions, and companies throughout the country.

¹ *Spin-Off Companies from MIT Lincoln Laboratory*, Lexington, Mass.: MIT Lincoln Laboratory (June 1990).

² *Unclassified Publications of Lincoln Laboratory*, Lexington, Mass.: MIT Lincoln Laboratory (annual).

Finally, the Laboratory exchanges technical information with all branches of the Department of Defense, other government agencies, academia, and industry. This interchange is encouraged by the numerous professional visits made to the Laboratory: each year, over 20,000 visitors are drawn to our technical seminars, workshops, briefings, and demonstrations.

THE TECHNOLOGY LICENSING OFFICE (TLO)

The Technology Licensing Office works with industry, venture capital sources, and entrepreneurs to find the best way to commercialize the new technologies developed at MIT and Lincoln Laboratory. Historically, the Massachusetts Institute of Technology's approach has been to patent inventions. Four years ago, however, the Institute brought a greater emphasis to licensing. The success of this change is impressive with over 100 patents issued last year alone; 48% of these patents licensed or optioned at the time of issue. A branch office opened at Lincoln Laboratory just two years ago was a direct outcome of this success.

SELECTED PROFILES IN CREATIVITY



JAY W. FORRESTER HOLDS AN ARRAY CONTAINING OVER 1000 TINY MAGNETIC CORES DEVELOPED AT MIT TO SERVE AS THE "MEMORY" FOR THE INSTITUTE'S WHIRLWIND I COMPUTER.

JAY FORRESTER received a B.S. in Electrical Engineering from the University of Nebraska and an S.M. in Electrical Engineering from the Massachusetts Institute of Technology. From 1952 until 1956, he was Head of Lincoln Laboratory's Digital Computer Division. In 1956, he joined the MIT faculty as professor at its Sloan School of Management. Since 1972, he has been the Germeshausen Professor of Management at Sloan where he directs the Systems Dynamics Program.

INVENTION: MULTICOORDINATE DIGITAL INFORMATION STORAGE (MAGNETIC CORE MEMORY) DEVICE

The magnetic core memory device, patented in 1956, consisted of a plane array of small doughnut-shaped ferrite cores; four wires threaded through each core carry current pulses that were used to sense the information stored in the memory and to write in new information. This concept increased both the speed and reliability of computer memory systems. For over two decades, random-access, coincident-current magnetic storage was the standard memory device for high-speed digital computers. Jay Forrester holds the basic patent for this invention.

United States patent 2,736,880 has been granted for this invention.



DR. ALICE M. CHIANG WITH HER CHARGE-DOMAIN PARALLEL PROCESSING NETWORK.

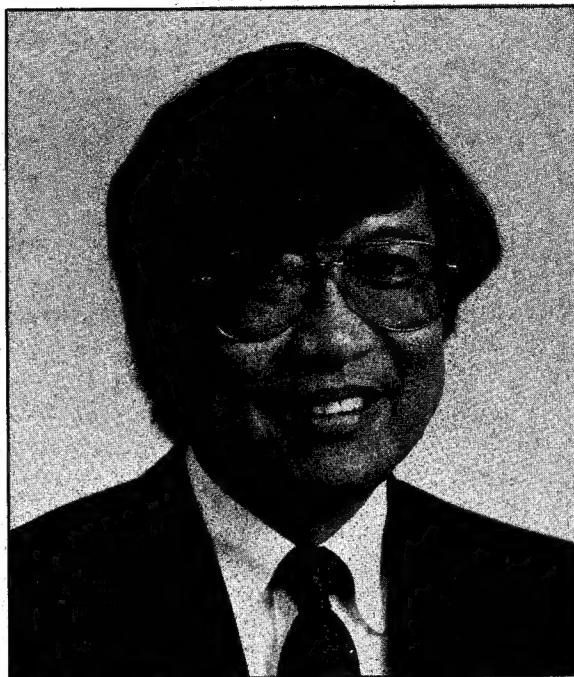
ALICE CHIANG received a B.S. in Physics from the National Taiwan University and a Ph.D. in Physics from Virginia Polytechnic Institute. She is currently a Senior Staff Member in the Microelectronics Group of the Laboratory's Solid State Division.

INVENTION: A CHARGE-DOMAIN PARALLEL PROCESSING NETWORK

A parallel processing architecture was developed based on charge-domain local memories and computing elements. A floating-gate charge-coupled device (CCD) tapped delay line is used for holding and shifting analog charge packets of sampled data. Using an array (or a matrix) of CCD digital-analog multipliers, the output is a charge packet proportional to the sum of the products of the analog sampled data and a set of digital words.

This invention is ideally suited for high-speed, real-time access and computation of a large amount of data in a low-cost, low-power image processing system. Possible applications include aircraft- or spacecraft-mounted weather radar or collision avoidance radar, nationwide computer and time sharing networks for teleconferenced image sharing, medical consultation, multispectral satellite images, facsimile transmission of images ranging from fingerprints to text, and image transmissions over existing telephone networks.

United States patent 4,464,726 has been granted for this invention.



DR. JOHN C.C. FAN'S TRANSPARENT HEAT MIRROR INVENTION PROVIDES HIGH SOLAR TRANSMISSION WITH MINIMAL THERMAL RADIATION LOSS.

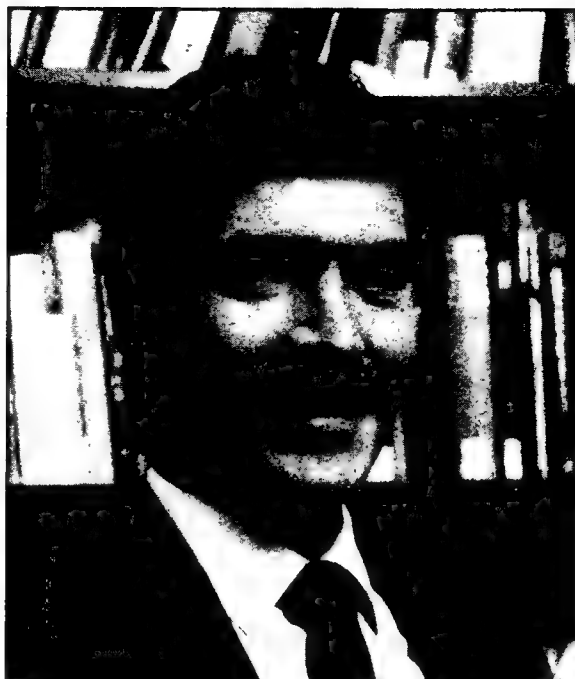
JOHN FAN received a B.S. in Electrical Engineering from the University of California, Berkeley and an M.S. and a Ph.D. in Applied Physics from Harvard University. He is currently the Chairman and Chief Executive Officer of Kopin Corporation in Taunton, Massachusetts. Before founding Kopin in 1984, he was the Associate Group Leader of the Electronic Materials Group in the Laboratory's Solid State Division.

INVENTION: TRANSPARENT HEAT MIRROR

Working with a colleague, John has been granted several patents for the concept of a transparent, composite film, heat mirror. These include a discrete and continuous layer of metallic silver sandwiched between an outer, protective layer that is both transparent and antireflective and a transparent, phase-matching layer. This combination of layers is chosen to provide high solar transmission with minimum loss of thermal radiation.

Transparent heat mirrors allow sunlight and visible light through, but reflect infrared and thermal energy. Some of the applications are coatings for thermal solar collectors, energy saving lightbulbs, thermal windows, and transparent furnaces.

United States patents 4,721,349; 4,556,277; and 4,337,990 have been granted for this concept. These patents have been licensed by MIT to industrial companies, and energy-saving commercial products are available.



DR. MATTHEW W. GANZ DEVELOPED A TECHNIQUE MAKING RADAR SYSTEMS ROBUST IN CONGESTED SIGNAL ENVIRONMENTS.

MATTHEW GANZ received a B.S., an M.S., and a Ph.D. in Electrical Engineering from Ohio State University, Columbus. He is currently an Assistant Group Leader in the Radar Systems Group of the Laboratory's Radar Measurements Division.

INVENTION: ADAPTIVE SIDELOBE BLANKER

Modern radar environments are often so congested with multiple signals that both interference and undesired reflections are experienced. Interference or large target returns in the antenna sidelobe region can either mask main-beam targets or cause false detections. In some applications, such interference may be intentionally generated to distract and impede the effectiveness of a radar system.

A technique was developed that allows two interference rejection techniques — adaptive nulling and sidelobe blanking — to be used simultaneously. Each technique prevents a different type of interference and their simultaneous use makes radar systems more robust in congested signal environments. Multiple adaptive antenna patterns are formed for a phased array radar. The signals from the antenna elements are sampled and a covariance matrix formed. The sample matrix inversion technique is implemented using different steering vectors to calculate adapted weights for both the main beam (or beams) and the sidelobe blanker.

United States patent 4,959,653 has been granted for this invention.



MR. NIKOLAY N. EFREMOW, DR. MICHAEL W. GEIS, AND PROFESSOR HENRY I. SMITH'S (NOT SHOWN), DIAMOND FILM MOSAICS PRODUCE NEAR SINGLE CRYSTAL QUALITY.

MICHAEL GEIS received a B.A. in Physics, an M.S. in Electrical Engineering, and a Ph.D. in Space Physics and Astronomy, all from Rice University. He is currently a Staff Member in the Submicrometer Technology Group of the Laboratory's Solid State Division.

HENRY SMITH received a B.S. in Physics from Holy Cross, and an M.S. and a Ph.D. in Physics from Boston College. While at the Laboratory, Henry was Assistant Leader in the Microelectronics Group. He is currently the Joseph F. and Nancy P. Keithly Professor of Electrical Engineering at the Massachusetts Institute of Technology.

NIKOLAY EFREMOW received an Associate's Degree in Electrical Engineering from Franklin Institute. He is an Assistant Staff Member in the Submicrometer Technology Group of the Laboratory's Solid State Division.

INVENTION: GROWTH OF LARGE AREA MOSAIC DIAMOND FILMS, APPROACHING SINGLE CRYSTAL QUALITY

Diamond's superior properties of heat conductivity, hardness, high breakdown voltage, and transparency to infrared rays make it a material of great potential value for many important commercial and military applications. However, the inability to obtain large area, single crystal diamond films has limited its practical applicability.

A new technique has been developed that produces large area mosaic films approaching single crystal quality. A silicon substrate is patterned and etched to form saw-tooth gratings or tetrahedral etched pits that conform to the shape of commercially available faceted diamond seeds. When single crystal seeds are deposited on this substrate, they become oriented with respect to the etched structures. When these seeds are used as the starting material for epitaxial growth, large areas of continuous mosaic diamond films are produced, which approach the crystallographic properties of single crystal diamond. At this time there is no other way to obtain such a large area diamond film with this degree of crystal quality approaching a single crystal diamond.

A patent application for this invention has been filed.



DR. LEONARD M. JOHNSON DEMONSTRATES AN APPARATUS FOR IMPROVING THE LINEARITY OF INTEGRATED-OPTICAL MODULATORS HAVING MILITARY AND COMMERCIAL USE.

LEONARD JOHNSON a native of Massachusetts, received his S.B., S.M., and Ph.D. degrees, all in Electrical Engineering, from the Massachusetts Institute of Technology. He is currently a Staff Member in the Electrooptical Devices Group of the Laboratory's Solid State Division.

INVENTION: APPARATUS AND METHOD FOR REDUCING MODULATOR NONLINEARITIES

An apparatus and method have been conceived and demonstrated for reducing optical modulator nonlinearities. High-linearity optical modulators are required for accurately transmitting analog signals with low distortion on low-loss optical fibers. The basic technique that has been developed for improving the linearity (optical transmission versus applied voltage) of integrated-optical modulators involves a cancellation scheme based on operating the modulator in two optical polarization states simultaneously. Using this technique, linear optical modulation at frequencies up to tens of gigahertz can be obtained.

Analog fiber-optic links employing linearized integrated-optical modulators are becoming increasingly attractive for both military and commercial applications, including phased-array radar signal distribution and cable television fiber-optic networks.

A patent application for this invention has been filed.



DR. ARAM MOORADIAN INVENTED A SOLID STATE LASER THAT HAS OPTICAL COMMUNICATIONS, LASER PRINTING, AND MEDICAL LASER APPLICATIONS, AMONG OTHERS.

ARAM MOORADIAN received a B.S. in Physics from the Worcester Polytechnic Institute and a Ph.D., also in Physics, from Purdue University. He is currently the Group Leader of the Quantum Electronics Group in the Laboratory's Solid State Division.

INVENTION: SOLID STATE LASER

Aram has invented a solid state, optically pumped microlaser. Although the laser is very small, it operates with precision frequency control, narrow linewidth, and tunability. It can be mass produced at very low cost using semiconductor processing and packaging technology.

Applications include optical communications, laser printing, projection display (including consumer television), robotics control, medical laser uses, and materials processing.

United States patent 4,860,304 has been granted for this invention.



A. GREGORY ROCCO, JR. DESIGNED A DEVICE CAPABLE OF PREVENTING MAJOR COMPUTER NETWORK DISRUPTIONS.

A. GREGORY ROCCO received a B.S. in Electrical Engineering from the University of New Hampshire and an M.S., also in Electrical Engineering, from Purdue University. He is currently a Staff Member in the Battlefield Surveillance Group of the Laboratory's Surveillance and Control Division.

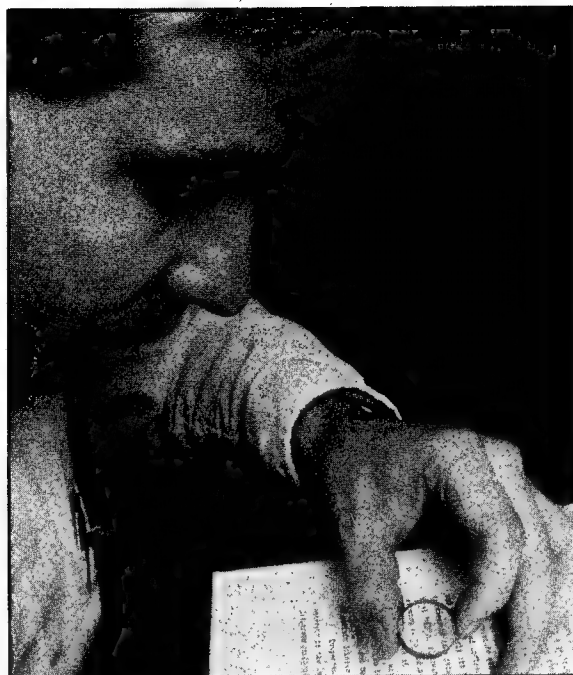
INVENTION: AUTOSPLIT

A token passing ring is a method of interconnecting computer systems. The machines or nodes are connected in series, with the output of one machine feeding the input to the next, creating a network in the form of a unidirectional communications ring. Any node in this ring may originate a message that is then passed from one node to the next until it arrives at its destination node. Normally, if the ring is broken, it goes down and the machines on the ring can no longer communicate with each other.

In installations of more than a few nodes, the ring is divided into subrings. These subrings are connected together at one or more central locations. At these locations there are switches that allow each subring to be switched in and out of the network. When any subring goes down, the entire network can be affected until the faulty subring is identified by an operator and switched off the main network. This restores network communications to all machines in the network except those on the malfunctioning subring. It takes time to recognize that the network is down, locate the malfunctioning subring, and flip the appropriate switch. Since it is not uncommon for system jobs to be run overnight or, in some cases, for several days, a system abort can be quite a serious disruption for many users.

Greg has invented a device he calls "Autosplit," which is designed to automatically recognize a network failure and switch out the faulty subring. This will generally be done fast enough to prevent a major disruption in ongoing work, except, of course, for the nodes on the malfunctioning subring.

A patent application has been filed.



DR. GARY J. SWANSON LOOKS THROUGH A DIFFRACTIVE/REFRACTIVE LENS THAT WILL IMPROVE VISUAL IMAGE AND COLOR IN BIFOCAL LENS IMPLANTS.

GARY SWANSON received a B.S. in Mathematics and a Ph.D. in Physics from the University of Michigan. He is currently a Staff Member in the Laser Radar Measurements Group of the Laboratory's Optics Division.

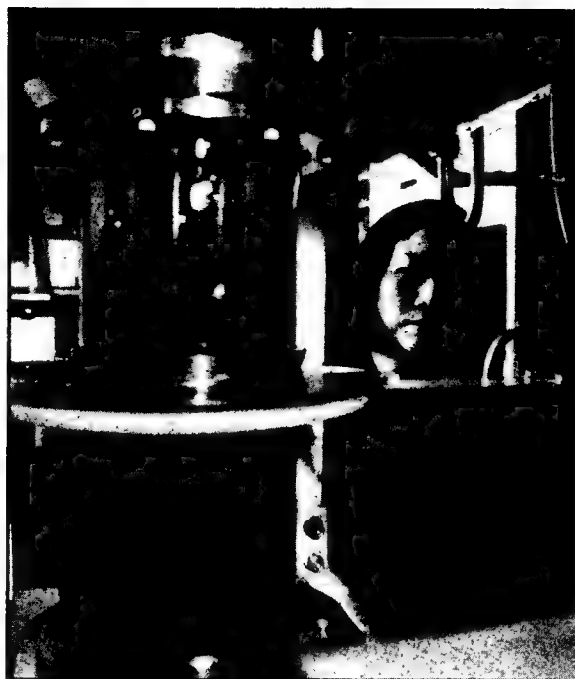
INVENTION: DIFFRACTIVE/REFRACTIVE LENS IMPLANT

Cataract patients commonly have their damaged natural lenses removed and replaced with artificial lens implants. The lenses usually implanted are refractive, i.e., they refract, or bend, light passing through them. The refractive lenses that are usually implanted only correct the focus on distant objects so patients need eyeglasses to see objects closer to them.

Diffraction is the breaking up or scattering of light as it passes by objects in its path. This effect can be achieved on a lens by covering its surface with a series of stepped ridges or notches. By constructing a "binary" lens that has both refractive and diffractive areas, bifocal vision is possible in one implanted lens.

This invention uses a nonrotationally symmetric diffractive structure placed on a refractive lens implant. The advantage of this design over other diffractive/refractive designs is an increase in image clarity and a reduction in false image coloration.

A patent application for this invention has been submitted.



DR. CHRISTINE A. WANG (IN PHOTO), **PROFESSOR ROBERT A. BROWN**, AND **MR. JAMES W. CAUNT** BUILT A REACTOR THAT PRODUCES SEMICONDUCTOR FILMS USED IN SPACE COMMUNICATIONS, OPTICAL RECORDING, AND OPTICAL COMPUTING.

CHRISTINE WANG received an S.B. in Materials Science and Engineering, an S.M. in Metallurgy, and a Ph.D. in Electronic Materials, all from the Massachusetts Institute of Technology. She is currently a Staff Member in the Electronic Materials Group of the Laboratory's Solid State Division.

JAMES CAUNT received an Associate's Degree in Mechanical Engineering from the Wentworth Institute of Technology, a B.S. in Industrial Technology from Northeastern University, and an MBA from Babson College. He is currently an Assistant Staff Member in the Laboratory's Solid State Division.

ROBERT BROWN received a B.S. and an M.S. from the University of Texas at Austin and a Ph.D. from the University of Minnesota. He is currently the Arthur D. Little Professor and Head of the Department of Chemical Engineering at the Massachusetts Institute of Technology.

INVENTION: VAPOR PHASE REACTOR FOR MAKING MULTILAYER STRUCTURES

A new reactor for producing semiconductor epitaxial layers such as GaAs, AlGaAs, and InGaAs has been designed, built, and tested. Results show that the reactor produces the most precisely controlled and uniform semiconductor films reported to date. Recognizing that the specific dynamics of the gas in the reactor have a profound influence on film quality, the researchers used a light-scattering technique to visualize the gas flow in the reactor. A numerical model of

reactor fluid flow and heat and mass transfer was developed to simulate epitaxial growth and to establish critical parameters for fabricating uniform layers with abrupt compositional changes.

The reactor, which permits the highly reproducible production of these epilayers, will increase yields and reduce production costs. The uniformity is especially critical for diode-pumped solid state lasers used in military applications, micro- and macro-machining, and medical applications, as well as for coherent diode laser arrays used in space communications, optical recording, and optical computing. In addition, reduced maintenance and simplicity of design are attractive for commercialization.

This invention has received a Notice of Allowability. The Air Force is soliciting proposals for an SBIR (Small Business Innovative Research) grant to develop this concept into a commercial product.

LIST OF PATENTS

U.S. PATENT No.

2,736,880*	MULTICOORDINATE DIGITAL INFORMATION STORAGE DEVICE	FORRESTER, J.W.	28 FEB 56
2,975,342	NARROW BASE PLANAR JUNCTION PUNCH-THRU DIODE	REDIKER, R.H.	14 MAR 61
2,978,704	RADOME STRUCTURAL DEVICES	COHEN, A. DAVIS, P. ORABONA, J.F.	4 APR 61
2,982,852	ANTI-MULTIPATH COMMUNICATION SYSTEM	FANO, R.M.	2 MAY 61
2,982,853	ANTI-MULTIPATH RECEIVING SYSTEM	PRICE, R. GREEN, P.E., JR.	2 MAY 61
2,990,259	SYRINGE-TYPE SINGLE-CRYSTAL FURNACE	MOODY, P.L. KOLM, C.R.	27 JUN 61
2,994,808	HIGH FLUX DENSITY APPARATUS	KOLM, H.H.	1 AUG 61
3,010,031	SYMMETRICAL BACK-CLAMPED TRANSISTOR SWITCHING CIRCUIT	BAKER, R.H.	21 NOV 61
3,011,711	CRYOGENIC COMPUTING DEVICES	BUCK, D.A.	5 DEC 61
3,037,195	DATA FILTERING SYSTEM	BIVANS, E.W.	29 MAY 62
3,077,578	SEMICONDUCTOR SWITCHING MATRIX	KINGSTON, R.H. MCWHORTER, A.L.	12 FEB 63
3,167,663	MAGNETO-SEMICONDUCTOR DEVICES	MELNGAILIS, I. CALAWA, A.R. REDIKER, R.H.	26 JAN 65
3,200,299	SUPERCONDUCTING ELECTROMAGNET	AUTLER, S.H.	10 AUG 65
3,281,802	MAGNETIC MEMORY CORE	MCMAHON, R.E.	25 OCT 66
3,289,110*	NON-RECIPROCAL MULTI-ELEMENT TEM TRANSMISSION LINE DEVICE	WEISS, J.A.	29 NOV 66
3,304,519	HIGH-FREQUENCY CIRCULATOR HAVING A PLURALITY OF DIFFERENTIAL PHASE SHIFTERS AND INTENTIONAL MISMATCH MEANS	WEISS, J.A.	14 FEB 67

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

3,324,334*	INDUCTION PLASMA TORCH WITH MEANS FOR RECIRCULATING THE PLASMA	REED, T.B.	6 JUN 67
3,382,161	ELECTROLYTIC SEPARATION OF TRANSITION METAL OXIDE CRYSTALS	KUNNMANN, W. FERRETTI, A. ARNOTT, R.J. ROGERS, D.B.	7 MAY 68
3,393,957	HIGH-FREQUENCY LIGHT MODULATOR OR SWITCH USING THE MAGNETO-OPTICAL PROPERTIES OF THIN MAGNETIC FILMS	SMITH, D.O.	23 JUL 68
3,395,345	METHOD AND MEANS FOR DETECTING THE PERIOD OF A COMPLEX ELECTRICAL SIGNAL	RADER, C.M.	30 JUL 68
3,425,051	ANALOG-TO-DIGITAL CONVERTER	SMITH, W.W.	28 JAN 69
3,448,421	SHIELDED MAGNETIC CORE	BERG, R.S. HOWLAND, B.	3 JUN 69
3,488,644	NON-DESTRUCTIVE READ-OUT CIRCUIT FOR A MAGNETIC MEMORY CORE	McMAHON, R.E.	6 JAN 70
3,493,943	MAGNETORESISTIVE ASSOCIATIVE MEMORY	RAFFEL, J.I.	3 FEB 70
3,495,224	THIN FILM MEMORY SYSTEM	RAFFEL, J.I.	10 FEB 70
3,497,698	METAL INSULATOR SEMICONDUCTOR RADIATION DETECTOR	PHELAN, R.J., JR. DIMMOCK, J.O.	24 FEB 70
3,500,354	CONTENT-ADDRESSED MEMORY USING OPTICAL INTERROGATION	SMITH, D.O. HARTE, K.J.	10 MAR 70
3,515,606	METHODS OF IMPROVING MAGNETIC CHARACTERISTICS OF FILMS FOR MEMORY APPLICATION	CROWTHER, T.S.	2 JUN 70
3,516,080	MAGNETO-OPTICAL MEMORY SENSING USING THERMAL MODULATION	SMITH, D.O.	2 JUN 70
3,518,578	SIGNAL COMPRESSION AND EXPANSION SYSTEM	OPPENHEIM, A.V. STOCKHAM, T.G., JR.	30 JUN 70
3,521,835	SYNCHRONOUS SATELLITE	BRAGA-ILLA, A.A. MORROW, W.E., JR.	28 JUL 70

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

3,566,383	METHODS OF IMPROVING THE SIGNAL-TO-NOISE RATIO OF PHOTON AND ELECTRON BEAM ACCESSED MAGNETIC FILM MEMORY SYSTEM	SMITH, D.O.	23 FEB 71
3,568,087	OPTICALLY PUMPED SEMICONDUCTOR LASER	PHELAN, R.J., JR. REDIKER, R.H.	2 MAR 71
3,590,248	LASER ARRAYS	CHATTERTON, E.J., JR	29 JUN 71
3,619,067*	METHOD AND APPARATUS FOR DETERMINING OPTICAL FOCAL DISTANCE	HOWLAND, B. PROLL, A.F.	9 NOV 71
3,625,660*	METHOD AND STRUCTURE FOR GROWING CRYSTALS	REED, T.B. POLLARD, E.R.	7 DEC 71
3,626,154*	TRANSPORT FURNACE	REED, T.B.	7 DEC 71
3,636,471	METHOD OF AND APPARATUS FOR ENHANCING RADIATION FROM INDIRECT-GAP SEMICONDUCTORS	REDIKER, R.H.	18 JAN 72
3,649,838	SEMICONDUCTOR DEVICE FOR PRODUCING RADIATION IN RESPONSE TO INCIDENT RADIATION	PHELAN, R.J., JR.	14 MAR 72
3,655,986	LASER DEVICE	LAX, B.	11 APR 72
3,676,795	MULTIPLE-FREQUENCY LASER APPARATUS AND METHOD	PRATT, G.W., JR.	11 JUL 72
3,703,958	EDDY CURRENT APPARATUS AND METHOD OF APPLICATION TO A CONDUCTIVE MATERIAL	KOLM, H.H.	28 NOV 72
3,720,884*	METHOD AND APPARATUS FOR COMPRESSION OF OPTICAL LASER PULSES	KELLEY, P.L. FISHER, R.A. GUSTAFSON, T.K.	13 MAR 73
3,742,229*	SOFT X-RAY MASK ALIGNMENT SYSTEM	SMITH, H.I. SPEARS, D.L. STERN, E.	26 JUN 73
3,742,230*	SOFT X-RAY MASK SUPPORT SUBSTRATE	SPEARS, D.L. SMITH, H.I. STERN, E.	26 JUN 73

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

3,743,842*	SOFT X-RAY LITHOGRAPHIC APPARATUS AND PROCESS	SMITH, H.I. SPEARS, D.L. STERN, E.	3 JUL 73
3,746,867	RADIATION RESPONSIVE SIGNAL STORAGE DEVICE	PHELAN, R.J., JR. DIMMOCK, J.O.	17 JUL 73
3,748,593	METHOD AND MEANS OF CON- STRUCTION OF A SEMICONDUCTOR MATERIAL FOR USE AS A LASER	DIMMOCK, J.O. MELNGAILIS, I. STRAUSS, A.J.	24 JUL 73
3,768,417	TRANSPORTATION SYSTEM EMPLOYING AN ELECTROMAGNETICALLY SUSPENDED, GUIDED AND PROPELLED VEHICLE	THORNTON, R.D. KOLM, H.H.	30 OCT 73
3,789,327	MICRO-ACOUSTIC WAVEGUIDE	WALDRON, R.A. STERN, E.	29 JAN 74
3,794,844	METHOD AND MEANS OF CONSTRUCTION OF A SEMICONDUCTOR MATERIAL FOR USE IN A LASER	DIMMOCK, J.O. MELNGAILIS, I. STRAUSS, A.J.	26 FEB 74
3,818,243	ERROR CORRECTION BY REDUNDANT PULSE POWERED CIRCUITS	MCMAHON, R.E.	18 JUN 74
3,831,173*	GROUND RADAR SYSTEM	LERNER, R.M.	20 AUG 74
3,842,751	TRANSPORTATION SYSTEM EMPLOYING AN ELECTROMAGNETICALLY SUSPENDED, GUIDED AND PROPELLED VEHICLE	THORNTON, R.D. KOLM, H.H.	22 OCT 74
3,857,990	HEAT PIPE FURNACE	STEININGER, J. REED, T.B.	31 DEC 74
3,863,070	QUANTUM MECHANICAL MOSFET INFRARED RADIATION DETECTOR	WHEELER, R.H. RALSTON, R.W.	28 JAN 75
3,869,618	HIGH-POWER TUNABLE FAR-INFRARED AND SUBMILLIMETER SOURCE	LAX, B. AGGARWAL, R.L.	4 MAR 75
3,871,017	HIGH-FREQUENCY PHONON GENERATING APPARATUS AND METHOD	PRATT, G.W., JR.	11 MAR 75
3,871,215	OPTO-ELECTRONIC APPARATUS TO GENER- ATE A PULSE-MODULATED SIGNAL INDICA- TIVE OF THE MECHANICAL STATE OF A SYSTEM	PRATT, G.W., JR. MCMULLIN, P.G.	18 MAR 75

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

3,871,301	STABILIZATION AND RIDE CONTROL OF SUSPENDED VEHICLES PROPELLED BY A LINEAR MOTOR	KOLM, H.H. THORNTON, R.D.	18 MAR 75
3,879,235	METHOD OF GROWING FROM SOLUTION MATERIALS EXHIBITING A PELTIER EFFECT AT THE SOLID-MELT INTERFACE	GATOS, H.C. WITT, A.F. LICHTENSTEIGER, M.	22 APR 75
3,883,831	SURFACE WAVE DEVICES	WILLIAMSON, R.C. STERN, E.	13 MAY 75
3,886,530*	SIGNAL STORAGE DEVICE	HUBER, E.E., JR. COHEN, M.S., JR. SMITH, D.O.	27 MAY 75
3,887,937	SEMICONDUCTOR SENSOR	GATOS, H.C. LAGOWSKI, J.	3 JUN 75
3,897,766	APPARATUS ADAPTED TO OPTO- ELECTRICALLY MONITOR THE OUTPUT OF A PRIME MOVER TO PROVIDE SIG- NALS WHICH ARE FED BACK TO THE INPUT AND THEREBY PROVIDE CONTROL OF THE PRIME MOVER	PRATT, G.W., JR. MCMULLIN, P.G.	5 SEP 75
3,912,394	METHOD AND SYSTEM OF INTER- FEROMETRIC MEASUREMENTS OF MODULATION TRANSFER FUNCTIONS	KELSALL, D.	14 OCT 75
3,927,385	LIGHT EMITTING DIODE	PRATT, G.W., JR.	16 DEC 75
3,941,670	METHOD OF ALTERING BIOLOGICAL AND CHEMICAL ACTIVITY OF MOLE- CULAR SPECIES	PRATT, G.W., JR.	2 MAR 76
3,950,645	INFRARED DETECTION TUBE	ROTSSTEIN, J. KEYES, R.J.	13 APR 76
3,963,515	VACUUM CLEANING	HALDEMAN, C.W. COVERT, E.E.	15 JUN 76
3,965,277	PHOTOFORMED PLATED INTERCONNECTION OF EMBEDDED INTEGRATED CIRCUIT CHIPS	GUDITZ, E.A. BURKE, R.L.	22 JUN 76
3,974,382*	LITHOGRAPHIC MASK ATTRACTION SYSTEM	BERNACKI, S.E.	10 AUG 76

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

3,974,412	SPARK PLUG EMPLOYING BOTH CORONA DISCHARGE AND ARC DISCHARGE AND A SYSTEM EMPLOYING THE SAME	PRATT, G.W., JR.	10 AUG 76
3,984,680	SOFT X-RAY MASK ALIGNMENT SYSTEM	SMITH, H.I.	5 OCT 76
4,011,745	SEMICONDUCTOR SENSORS	GATOS, H.C. LAGOWSKI, J.	15 MAR 77
4,016,412	SURFACE WAVE DEVICES FOR PROCESSING SIGNALS	STERN, E. WILLIAMSON, R.C.	5 APR 77
4,020,388	DISCHARGE DEVICE	PRATT, G.W., JR.	26 APR 77
4,027,383	INTEGRATED CIRCUIT PACKAGING	HERNDON, T.O. RAFFEL, J.I.	7 JUN 77
4,038,216	MATERIAL AND METHOD OF MAKING SECONDARY-ELECTRON EMITTERS	HENRICH, V.E. FAN, J.C.C.	26 JUL 77
4,049,891	COMPOSITIONS FOR FAST ALKALI-METAL-ION TRANSPORT	HONG, H.Y-P. GOODENOUGH, J.B.	20 SEP 77
4,055,758	SURFACE WAVE DEVICES FOR PROCESSING SIGNALS	STERN, E. WILLIAMSON, R.C. BERS, A. CAFARELLA, J.H.	25 OCT 77
4,059,461*	METHOD FOR IMPROVING THE CRYSTALLINITY OF SEMICONDUCTOR FILMS BY LASER BEAM SCANNING AND THE PRODUCTS THEREOF	FAN, J.C.C. ZEIGER, H.J.	22 NOV 77
4,063,105	METHOD OF AND APPARATUS FOR GENERATING TUNABLE COHERENT RADIATION BY NONCOLLINEAR PHASE-MATCHED SUM-DIFFERENCE FREQUENCY OPTICAL MIXING	AGGARWAL, R.L. LEE, N.K. LAX, B.	13 DEC 77
4,066,984	SURFACE ACOUSTIC WAVE DEVICES FOR PROCESSING AND STORING SIGNALS	STERN, E. INGEBRIGTSEN, K.A.	3 JAN 78
4,067,037	TRANSISTOR HAVING HIGH FT AT LOW CURRENTS	GREIFF, P.	3 JAN 78
4,075,706	SURFACE WAVE DEVICES FOR PROCESSING SIGNALS	STERN, E. WILLIAMSON, R.C. SMITH, H.I.	21 FEB 78

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,087,719	SPARK PLUG	PRATT, G.W., JR.	2 MAY 78
4,087,976	ELECTRIC POWER PLANT USING ELECTRO- LYTIC CELL-FUEL CELL COMBINATION	MORROW, W.E., JR. HSU, M.S.	9 MAY 78
4,093,927*	PULSED GAS LASER	LEVINE, J.S.	6 JUN 78
4,101,965	SURFACE ACOUSTIC WAVE DEVICES FOR PROCESSING AND STORING SIGNALS	INGEBRIGTSEN, K.A. BERS, A. CAFARELLA, J.H.	18 JUL 78
4,107,544	TWO-PHOTON RESONANT LASER MIXING IN MOLECULAR LIQUIDS	KILDAL, H. BRUECK, S.R.J.	15 AUG 78
4,115,228	METHOD OF MAKING SECONDARY ELECTRON EMITTERS	HENRICH, V.E. FAN, J.C.C.	19 SEP 78
4,115,280	APPARATUS FOR ALTERING THE BIOLOGICAL AND CHEMICAL ACTIVITY OF MOLECULAR SPECIES	PRATT, G.W., JR.	19 SEP 78
4,117,103	LITHIUM ION TRANSPORT COMPOSITIONS	HONG, H.Y-P.	26 SEP 78
4,119,855	NONVACUUM SOFT X-RAY LITHO- GRAPHIC SOURCE	BERNACKI, S.E.	10 OCT 78
4,127,900	READING CAPACITOR MEMORIES WITH A VARIABLE VOLTAGE RAMP	RAFFEL, J.I. YASAITIS, J.A.	28 NOV 78
4,140,369	EFFICIENT LIGHT DIFFUSER	HOWLAND, B.	20 FEB 79
4,142,924*	FAST-SWEEP GROWTH METHOD FOR GROWING LAYERS USING LIQUID PHASE EPITAXY	HSIEH, J.J.	6 MAR 79
4,150,177	METHOD FOR SELECTIVELY NICKELING A LAYER OF POLYMERIZED POLYESTER RESIN	GUDITZ, E.A. BURKE, R.L.	17 APR 79
4,166,669	PLANAR OPTICAL WAVEGUIDE, MODULATOR, VARIABLE COUPLER AND SWITCH	LEONBERGER, F.J. DONNELLY, J.P.	4 SEP 79
4,170,512	METHOD OF MANUFACTURE OF A SOFT-X-RAY MASK	FLANDERS, D.C. SMITH, H.I. DALOMBA, M.A.	9 OCT 79
4,172,882	LITHIUM ION TRANSPORT COMPOSITIONS	HONG, H.Y-P.	30 OCT 79

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,184,172*	DIELECTRIC ISOLATION USING SHALLOW OXIDE AND POLYCRYSTALLINE SILICON	RAFFEL, J.I. BERNACKI, S.E.	15 JAN 80
4,186,045	METHOD OF EPITAXIAL GROWTH EMPLOYING ELECTROMIGRATION	GATOS, H.C. JASTRZEBSKI, L.L.	29 JAN 80
4,197,141*	METHOD FOR PASSIVATING IMPERFECTIONS IN SEMICONDUCTOR MATERIALS	BOZLER, C.O. FAN, J.C.C.	8 APR 80
4,200,395	ALIGNMENT OF DIFFRACTION GRATINGS	SMITH, H.I. AUSTIN, S.S. FLANDERS, D.C.	29 APR 80
4,220,510	METHOD FOR SEPARATING ISOTOPES IN THE LIQUID PHASE AT CRYOGENIC TEMPERATURE	BRUECK, S.R.J. OSGOOD, R.M., JR.	2 SEP 80
4,227,941*	SHALLOW-HOMOJUNCTION SOLAR CELLS	BOZLER, C.O. CHAPMAN, R.L. FAN, J.C.C. McCLELLAND, R.W.	14 OCT 80
4,231,819	DIELECTRIC ISOLATION METHOD USING SHALLOW OXIDE AND POLYCRYSTALLINE SILICON UTILIZING A PRELIMINARY ETCHING STEP	RAFFEL, J.I. BERNACKI, S.E.	4 NOV 80
4,242,736	CAPACITOR MEMORY AND METHODS FOR READING, WRITING, AND FABRICATING CAPACITOR MEMORIES	RAFFEL, J.I. YASAITIS, J.A.	30 DEC 80
4,248,675*	METHOD OF FORMING ELECTRICAL CONTACT AND ANTIREFLECTION LAYER ON SOLAR CELLS	BOZLER, C.O. CHAPMAN, R.L. FAN, J.C.C. McCLELLAND, R.W.	3 FEB 81
4,248,687*	METHOD OF FORMING TRANSPARENT HEAT MIRRORS ON POLYMERIC SUBSTRATES	FAN, J.C.C.	3 FEB 81
4,254,174	SUPPORTED MEMBRANE COMPOSITE STRUCTURE AND ITS METHOD OF MANUFACTURE	FLANDERS, D.C. SMITH, H.I. DALOMBA, M.A.	3 MAR 81
4,256,787	ORIENTATION OF ORDERED LIQUIDS AND THEIR USE IN DEVICES	SHAVER, D.C. SMITH, H.I. FLANDERS, D.C.	17 MAR 81

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,257,690	EYE TESTING CHART	HOWLAND, B.	24 MAR 81
4,258,375*	GAInAsP/INP AVALANCHE PHOTODIODE AND METHOD FOR ITS FABRICATION	HSIEH, J.J. HURWITZ, C.E.	24 MAR 81
4,268,095	MAGNETIC BEARING	MILLNER, A.R.	19 MAY 81
4,268,808	ACOUSTIC WAVE DEVICE	MELNGAILIS, J.	19 MAY 81
4,274,737	TEST PATTERNS FOR LENS EVALUATION	HOWLAND, B.	23 JUN 81
4,283,235	DIELECTRIC ISOLATION USING SHALLOW OXIDE AND POLYCRYSTALLINE SILICON UTILIZING SELECTIVE OXIDATION	RAFFEL, J.I. BERNACKI, S.E.	11 AUG 81
4,287,235	X-RAY LITHOGRAPHY AT (ABOUT) 100 ANGSTROMS LINEWIDTHS USING X-RAY MASKS FABRICATED BY SHADOWING TECHNIQUES	FLANDERS, D.C.	1 SEP 81
4,287,485*	GAInAsP/INP DOUBLE- HETEROSTRUCTURE LASERS	HSIEH, J.J.	1 SEP 81
4,290,118	SOLID STATE DEVICES COMBINING THE USE OF SURFACE-ACOUSTIC- WAVE DEVICES AND CHARGE- COUPLED DEVICES	STERN, E. RALSTON, R.W. SMYTHE, D.L., JR. BURKE, B.E.	15 SEP 81
4,291,390	ANALOG SOLID STATE MEMORY	STERN, E. RALSTON, R.W. SMYTHE, D.L., JR. BURKE, B.E.	22 SEP 81
4,298,280	INFRARED RADAR SYSTEM	HARNEY, R.C.	3 NOV 81
4,298,953	PROGRAMMABLE ZERO-BIAS FLOATING GATE TAPPING METHOD AND APPARATUS	MUNROE, S.C.	3 NOV 81
4,309,225*	METHOD OF CRYSTALLIZING AMORPHOUS MATERIAL WITH A MOVING ENERGY BEAM	FAN, J.C.C. ZEIGER, H.J.	5 JAN 82
4,312,915	CERMET FILM SELECTIVE BLACK ABSORBER	FAN, J.C.C.	26 JAN 82
4,313,159	DATA STORAGE AND ACCESS APPARATUS	SHOAP, S.D.	26 JAN 82
4,313,178	ANALOG SOLID STATE MEMORY	STERN, E. RALSTON, R.W.	26 JAN 82

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,320,247	SOLAR CELL HAVING MULTIPLE P-N JUNCTIONS AND PROCESS FOR PRODUCING SAME	GATOS, H.C. CHI, J-Y.	16 MAR 82
4,323,422	METHOD FOR PREPARING OPTICALLY FLAT DAMAGE-FREE SURFACE	CALAWA, A.R. GORMLEY, J.V. MANFRA, M.J.	6 APR 82
4,333,792	ENHANCING EPITAXY AND PREFERRED ORIENTATION	SMITH, H.I.	8 JUN 82
4,337,990*	TRANSPARENT HEAT-MIRROR	FAN, J.C.C. BACHNER, F.J.	6 JUL 82
4,340,305	PLATE ALIGNING	SMITH, H.I. AUSTIN, S.S. FLANDERS, D.C.	20 JUL 82
4,340,617*	METHOD AND APPARATUS FOR DEPOSITING A MATERIAL ON A SURFACE	DEUTSCH, T.F. EHRlich, D.J. OSGOOD, R.M., JR.	20 JUL 82
4,342,970	ACOUSTIC WAVE DEVICE	MELNGAILIS, J. HAUS, H.A. LATTES, A.L.	3 AUG 82
4,352,105	DISPLAY SYSTEM	HARNEY, R.C.	28 SEP 82
4,357,183*	HETEROEPITAXY OF GERMANIUM SILICON ON SILICON UTILIZING ALLOYING CONTROL	FAN, J.C.C. GALE, R.P.	2 NOV 82
4,360,586	SPATIAL PERIOD DIVISION EXPOSING	FLANDERS, D.C. SMITH, H.I.	23 NOV 82
4,366,338*	COMPENSATING SEMICONDUCTOR MATERIALS	TURNER, G.W. FAN, J.C.C. SALERNO, J.P.	28 DEC 82
4,370,194	ORIENTATION OF ORDERED LIQUIDS AND THEIR USE IN DEVICES	SHAVER, D.C. SMITH, H.I. FLANDERS, D.C.	25 JAN 83
4,371,421	LATERAL EPITAXIAL GROWTH BY SEEDED SOLIDIFICATION	FAN, J.C.C. GEIS, M.W. TSAUR, B-Y.	1 FEB 83

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,372,791*	METHOD FOR FABRICATING DH LASERS	HSIEH, J.J.	8 FEB 83
4,372,996	METHOD FOR METALLIZING ALUMINUM PADS OF AN INTEGRATED CIRCUIT CHIP	GUDITZ, E.A. BURKE, R.L.	8 FEB 83
4,376,228*	SOLAR CELLS HAVING ULTRATHIN ACTIVE LAYERS	FAN, J.C.C. BOZLER, C.O.	8 MAR 83
4,376,285	HIGH SPEED OPTOELECTRONIC SWITCH	LEONBERGER, F.J. O'DONNELL, F.J.	8 MAR 83
4,378,629*	SEMICONDUCTOR EMBEDDED LAYER TECHNOLOGY INCLUDING PERMEABLE BASE TRANSISTOR, FABRICATION METHOD	BOZLER, C.O. ALLEY, G.D. LINDLEY, W.T. MURPHY, R.A.	5 APR 83
4,382,660	OPTICAL TRANSISTORS AND LOGIC CIRCUITS EMBODYING THE SAME	PRATT, G.W., JR. JAIN, K.	10 MAY 83
4,384,299	CAPACITOR MEMORY AND METHODS FOR READING, WRITING, AND FABRICATING CAPACITOR MEMORIES	RAFFEL, J.I. YASAITIS, J.A.	17 MAY 83
4,410,237	METHOD AND APPARATUS FOR SHAPING ELECTROMAGNETIC BEAMS	VELDKAMP, W.B.	18 OCT 83
4,420,873	OPTICAL GUIDED WAVE DEVICES EMPLOYING SEMICONDUCTOR-INSULATOR STRUCTURES	LEONBERGER, F.J. MELNGAILIS, I. BOZLER, C.O. McCLELLAND, R.W.	20 DEC 83
4,426,712	CORRELATION SYSTEM FOR GLOBAL POSITION RECEIVER	GORSKI-POPIEL, G.	17 JAN 84
4,438,520	SYSTEM FOR REGENERATING A DATA WORD ON A COMMUNICATIONS RING	SALTZER, J.H.	20 MAR 84
4,442,166	CERMET FILM SELECTIVE-BLACK ABSORBER	FAN, J.C.C.	10 APR 84
4,444,992	PHOTOVOLTAIC-THERMAL COLLECTORS	COX, C.H., III	24 APR 84
4,447,149	PULSED LASER RADAR APPARATUS	MARCUS, S. QUIST, T.M.	8 MAY 84
4,454,371	SOLAR ENERGY CONCENTRATOR SYSTEM	FOLINO, F.A.	12 JUN 84
4,458,324	CHARGE DOMAIN MULTIPLYING DEVICE	BURKE, B.E. CHIANG, A.M. LINDLEY, W.T.	3 JUL 84

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,464,726	CHARGE DOMAIN PARALLEL PROCESSING NETWORK	CHIANG, A.M.	7 AUG 84
4,468,850*	GAInAsP/INP DOUBLE-HETEROSTRUCTURE LASERS	LIAU, Z-L. WALPOLE, J.N.	4 SEP 84
4,473,805	PHASE LOCK LOSS DETECTOR	GUHN, D.K.	25 SEP 84
4,479,224	FIBER-COUPLED EXTERNAL CAVITY SEMICONDUCTOR LASER	REDIKER, R.H.	23 OCT 84
4,479,846	METHOD OF ENTRAINING DISLOCATIONS AND OTHER CRYSTALLINE DEFECTS IN HEATED FILM CONTACTING PATTERNED REGION	SMITH, H.I. GEIS, M.W.	30 OCT 84
4,489,390	SPATIAL FILTER SYSTEM	PARENTI, R.R. KEICHER, W.E.	18 DEC 84
4,490,445	SOLID OXIDE ELECTROCHEMICAL ENERGY CONVERTER	Hsu, M.S.	25 DEC 84
4,499,441	SUPERCONDUCTING SIGNAL PROCESSING CIRCUITS	LYNCH, J.T. ANDERSON, A.C. WITHERS, R.S. WRIGHT, P.V.	12 FEB 85
4,501,966	INFRARED MICROSCOPE INSPECTION APPARATUS	FORMAN, S.E. CAUNT, J.W.	26 FEB 85
4,508,431	PHOTOREFRACTIVE LASER BEAM-STEERING DEVICE	HENSHAW, P.D.	2 APR 85
4,511,216	HIGH POWER LASER DUMP	Hsu, M.S. Hsu, J.P.	16 APR 85
4,514,581*	SOLAR CELLS HAVING ULTRATHIN ACTIVE LAYERS	FAN, J.C.C. BOZLER, C.O.	30 APR 85
4,518,219	OPTICAL GUIDED WAVE DEVICES EMPLOYING SEMICONDUCTOR-INSULATOR STRUCTURES	LEONBERGER, F.J. MELNGAILIS, I. BOZLER, C.O. McCLELLAND, R.W.	21 MAY 85
4,525,871	HIGH SPEED OPTOELECTRONIC MIXER	FOYT, A.G. LEONBERGER, F.J. WILLIAMSON, R.C.	25 JUN 85

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,547,622*	SOLAR CELLS AND PHOTODETECTORS	FAN, J.C.C. GALE, R.P.	15 OCT 85
4,553,265	MONOLITHIC SINGLE AND DOUBLE SIDE BAND MIXER APPARATUS	CLIFTON, B.J. ALLEY, G.D.	12 NOV 85
4,556,277*	TRANSPARENT HEAT-MIRROR	FAN, J.C.C. BACHNER, F.J.	3 DEC 85
4,558,290	A COMPACT BROADBAND REC- TANGULAR TO COAXIAL WAVEGUIDE JUNCTION	LEE, J.C.	10 DEC 85
4,563,765	INTRA-CAVITY LOSS-MODULATED DIODE LASER	TSANG, D.Z. WALPOLE, J.N.	7 JAN 86
4,565,599*	GRAPHOEPIITAXY BY ENCAPSULATION	GEIS, M.W. SMITH, H.I. ANTONIADIS, D. FLANDERS, D.C.	21 JAN 86
4,567,110	HIGH-TEMPERATURE BRAZED CERAMIC JOINTS	JARVINEN, P.O.	28 JAN 86
4,585,490	METHOD OF MAKING A CONDUCTIVE PATH IN MULTI-LAYER METAL STRUCTURES BY LOW POWER LASER BEAM	RAFFEL, J.I. YASAITIS, J.A. CHAPMAN, G.H. NAIMAN, M.L.	29 APR 86
4,608,117	MASKLESS GROWTH OF PATTERNED FILMS	EHRlich, D.J. DEUTSCH, T.F. OSGOOD, R.M., JR. SCHLOSSBERG, H.	26 AUG 86
4,609,890	BULK ACOUSTIC WAVE SIGNAL PRO- CESSING DEVICES	OATES, D.E. WRIGHT, P.V.	2 SEP 86
4,614,628	SOLID ELECTROLYTE STRUCTURE AND METHOD FOR FORMING	Hsu, M.S. WILSON, C.F.	30 SEP 86
4,615,904	METHOD FOR MASKLESS GROWTH OF PATTERNED FILMS	EHRlich, D.J. DEUTSCH, T.F. OSGOOD, R.M., JR. SCHLOSSBERG, H.	7 OCT 86
4,618,261	OPTICAL GAP MEASURING	FLANDERS, D.C. LYSZCZARZ, T.M.	21 OCT 86

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,619,894*	SOLID-TRANSFORMATION THERMAL RESIST	BOZLER, C.O. EHRlich, D.J. TSAO, J.Y.	28 OCT 86
4,632,712*	REDUCING DISLOCATIONS IN SEMI-CONDUCTORS UTILIZING REPEATED THERMAL CYCLING DURING MULTI-STAGE EPITAXIAL GROWTH	FAN, J.C.C. TSAUR, B-Y. GALE, R.P. DAVIS, F.M.	30 DEC 86
4,636,404	METHOD AND APPARATUS FOR FORMING LOW RESISTANCE LATERAL LINKS IN A SEMICONDUCTOR DEVICE	RAFFEL, J.I. YASAITIS, J.A. CHAPMAN, G.H.	13 JAN 87
4,642,142	PROCESS FOR MAKING MERCURY CADMIUM TELLURIDE	HARMAN, T.C.	10 FEB 87
4,644,751	INTEGRATED FUEL-CELL/STEAM PLANT FOR ELECTRICAL GENERATION	HSU, M.S.	24 FEB 87
4,649,351	APPARATUS AND METHOD FOR COHERENTLY ADDING LASER BEAMS	VELDKAMP, W.B. LEGER, J.R. SWANSON, G.J.	10 MAR 87
4,652,926	SOLID STATE IMAGING TECHNIQUE	WITHERS, R.S. RALSTON, R.W. STERN, E.	24 MAR 87
4,662,860	TELESCOPING LOW VIBRATION PULLING MECHANISM FOR CZOCHRALSKI CRYSTAL GROWTH	ISELER, G.W. AHERN, B.S.	5 MAY 87
4,668,528*	METHOD AND APPARATUS FOR PHOTODEPOSITION OF FILMS ON SURFACES	EHRlich, D.J. ARNONE, C. ROTHSCHILD, M.	26 MAY 87
4,670,088*	LATERAL EPITAXIAL GROWTH BY SEEDED SOLIDIFICATION	TSAUR, B-Y. FAN, J.C.C. GEIS, M.W.	2 JUN 87
4,672,254	SURFACE ACOUSTIC WAVE DEVICES AND METHOD OF MANUFACTURE THEREOF	DOLAT, V.S. EHRlich, D.J. TSAO, J.Y.	9 JUN 87
4,690,551	LASER RADAR UTILIZING PULSE-TONE WAVEFORM	EDWARDS, B.E. BIRON, D.G.	1 SEP 87

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,696,533	SPATIAL LIGHT MODULATOR	KINGSTON, R.H. LEONBERGER, F.J.	29 SEP 87
4,700,461*	PROCESS FOR MAKING JUNCTION FIELD-EFFECT TRANSISTORS	CHOI, H-K. TSAUR, B-Y.	20 OCT 87
4,710,959	VOICE ENCODER AND SYNTHESIZER	FELDMAN, J.A. HOFSTETTER, E.M.	1 DEC 87
4,718,070*	SURFACE EMITTING DIODE LASER	LIAU, Z-L. WALPOLE, J.N.	5 JAN 88
4,721,349*	TRANSPARENT HEAT-MIRROR	FAN, J.C.C. BACHNER, F.J.	26 JAN 88
4,722,092*	GAINAsP/INP DISTRIBUTED FEEDBACK LASER	LIAU, Z-L. FLANDERS, D.C. WALPOLE, J.N.	26 JAN 88
4,727,047*	METHOD OF PRODUCING SHEETS OF CRYSTALLINE MATERIAL	BOZLER, C.O. FAN, J.C.C. McCLELLAND, R.W.	23 FEB 88
4,734,152	DRY ETCHING PATTERNING OF ELECTRICAL AND OPTICAL MATE- RIALS	GEIS, M.W. EFREMOW, N., JR. PANG, S.W.	29 MAR 88
4,742,510	NEAR AND FAR ECHO CANCELLER FOR DATA COMMUNICATIONS	QUATIERI, T.F. O'LEARY, G.C.	3 MAY 88
4,745,452	TUNNELING TRANSFER DEVICES	SOLLNER, T.C.L.G.	17 MAY 88
4,746,620	LATERAL P-I-N PHOTODETECTOR	DIADIUK, V. GROVES, S.H.	24 MAY 88
4,748,045*	METHOD AND APPARATUS FOR PHOTO- DEPOSITION OF FILMS ON SURFACES	EHRlich, D.J. ROTHSCHILD, M.	31 MAY 88
4,756,927*	METHOD AND APPARATUS FOR REFRACTORY METAL DEPOSITION	BLACK, J.G. EHRlich, D.J.	12 JUL 88
4,774,205*	MONOLITHIC INTEGRATION OF SILICON AND GALLIUM ARSENIDE DEVICES	CHOI, H-K. TSAUR, B-Y. TURNER, G.W.	27 SEP 88
4,777,148*	PROCESS FOR MAKING A MESA GAINAsP/INP DISTRIBUTED FEEDBACK LASER	LIAU, Z-L. FLANDERS, D.C. WALPOLE, J.N.	11 OCT 88

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,784,722*	METHOD FORMING SURFACE EMITTING DIODE LASER	LIAU, Z-L. WALPOLE, J.N.	15 Nov 88
4,791,490	DETECTOR FOR THREE-DIMENSIONAL OPTICAL IMAGING	KNIGHT, F.K. KALATA, K.	13 DEC 88
4,794,556	METHOD AND APPARATUS FOR SAMPLING IN-PHASE AND QUADRATURE COMPONENTS	RADER, C.M.	27 DEC 88
4,798,437	METHOD AND APPARATUS FOR PROCESSING ANALOG OPTICAL WAVE SIGNALS	REDIKER, R.H. LEONBERGER, F.J. GREENWOOD, D.P.	17 JAN 89
4,810,663	METHOD OF FORMING CONDUCTIVE PATH BY LOW POWER LASER PULSE	RAFFEL, J.I. YASAITIS, J.A. CHAPMAN, G.H. NAIMAN, M.L. BURNS, J.A.	7 MAR 89
4,813,762	COHERENT BEAM COMBINING OF LASERS USING MICROLENSSES AND DIFFRACTIVE COUPLING	LEGER, J.R. VELDKAMP, W.B. SCOTT, M.L.	21 MAR 89
4,816,420*	METHOD OF PRODUCING TANDEM SOLAR CELL DEVICES FROM SHEETS OF CRYSTALLINE MATERIAL	BOZLER, C.O. FAN, J.C.C. McCLELLAND, R.W.	28 MAR 89
4,822,120*	TRANSPARENT HEAT-MIRROR	FAN, J.C.C. BACHNER, F.J.	18 APR 89
4,831,340	HARMONIC MULTIPLIER USING RESONANT TUNNELING DEVICE	SOLLNER, T.C.L.G.	16 MAY 89
4,834,834	LASER PHOTOCHEMICAL ETCHING USING SURFACE HALOGENATION	EHRlich, D.J. ROTHSCHILD, M.	30 MAY 89
4,837,182*	METHOD OF PRODUCING SHEETS OF CRYSTALLINE MATERIAL	BOZLER, C.O. FAN, J.C.C. McCLELLAND, R.W.	6 JUN 89
4,838,685	METHODS AND APPARATUS FOR MOTION ESTIMATION IN MOTION PICTURE PROCESSING	MARTINEZ, D.M. LEE, N.K.	13 JUN 89
4,839,145*	CHEMICAL VAPOR DEPOSITION REACTOR	GALE, R.P. FAN, J.C.C.	13 JUN 89

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

4,839,310	HIGH MOBILITY TRANSISTOR WITH OPPOSED-GATES	HOLLIS, M.A. GOODHUE, W.D. NICHOLS, K.B. BERGERON, N.J.	13 JUN 89
4,843,034	FABRICATION OF INTERLAYER CON- DUCTIVE PATHS IN INTEGRATED CIRCUITS	HERNDON, T.O. CHAPMAN, G.H.	27 JUN 89
4,848,880	SPATIAL LIGHT MODULATOR	AULL, B.F. GOODHUE, W.D.	18 JUL 89
4,853,076*	SEMICONDUCTOR THIN FILMS	TSAUR, B-Y. FAN, J.C.C. GEIS, M.W.	1 AUG 89
4,856,068	AUDIO PRE-PROCESSING METHODS AND APPARATUS	QUATIERI, T.F. MCAULAY, R.J.	8 AUG 89
4,860,304*	SOLID STATE MICROLASER	MOORADIAN, A.	22 AUG 89
4,864,378	SCHOTTKY BARRIER INFRARED DETECTOR	TSAUR, B-Y.	5 SEP 89
4,865,427	SPATIAL LIGHT MODULATOR	KINGSTON, R.H. LEONBERGER, F.J.	12 SEP 89
4,868,005*	METHOD AND APPARATUS FOR PHOTODEPOSITION OF FILMS ON SURFACES	EHRlich, D.J. ROTHSCHILD, M.	1 SEP 89
4,881,237	HYBRID TWO-DIMENSIONAL SURFACE-EMITTING LASER ARRAYS	DONNELLY, J.P.	14 NOV 89
4,885,790*	PROCESSING OF ACOUSTIC WAVEFORMS	MCAULAY, R.J. QUATIERI, T.F.	5 DEC 89
4,889,583*	CAPPING TECHNIQUE FOR ZONE- MELTING RECRYSTALLIZATION OF INSULATED SEMICONDUCTOR FILMS	CHEN, C.K. TSAUR, B-Y.	26 DEC 89
4,893,352	OPTICAL TRANSMITTER OF MODULATED SIGNALS	WELFORD, D.	9 JAN 90
4,894,840*	SURFACE EMITTING LASER	LIAU, Z-L. WALPOLE, J.N.	16 JAN 90

* PATENT HAS BEEN LICENSED

**U.S. PATENT
No.**

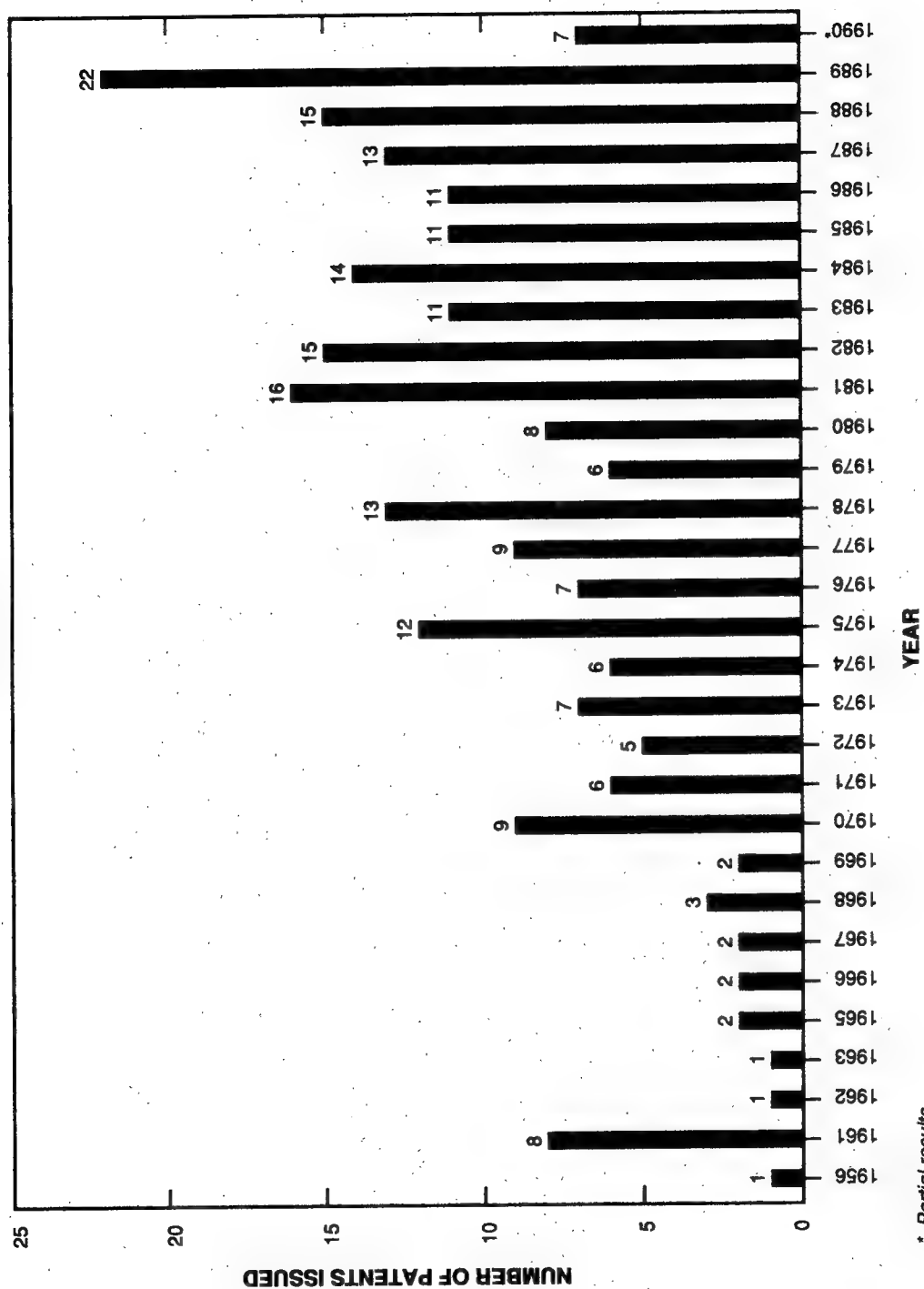
4,895,790*	HIGH-EFFICIENCY, MULTILEVEL, DIFFRACTIVE OPTICAL ELEMENTS	SWANSON, G.J. VELDKAMP, W.B.	23 JAN 90
4,903,089	VERTICAL TRANSISTOR DEVICE FABRICATED WITH SEMICONDUCTOR REGROWTH	HOLLIS, M.A. BOZLER, C.O. NICHOLS, K.B. BERGERON, N.J.	20 FEB 90
4,937,873*	COMPUTATIONALLY EFFICIENT SINE WAVE SYNTHESIS FOR ACOUSTIC WAVEFORM PROCESSING	McAULAY, R.J. QUATIERI, T.F.	26 JUN 90
4,947,143	MULTI-PORT POWER DIVIDER-COMBINER	ABOUZAHRA, M.D. GUPTA, K.C.	7 AUG 90
4,959,653	ADAPTIVE SIDELOBE BLANKER	GANZ, M.W.	25 SEP 90

* PATENT HAS BEEN LICENSED

MIT LINCOLN LABORATORY PATENTS

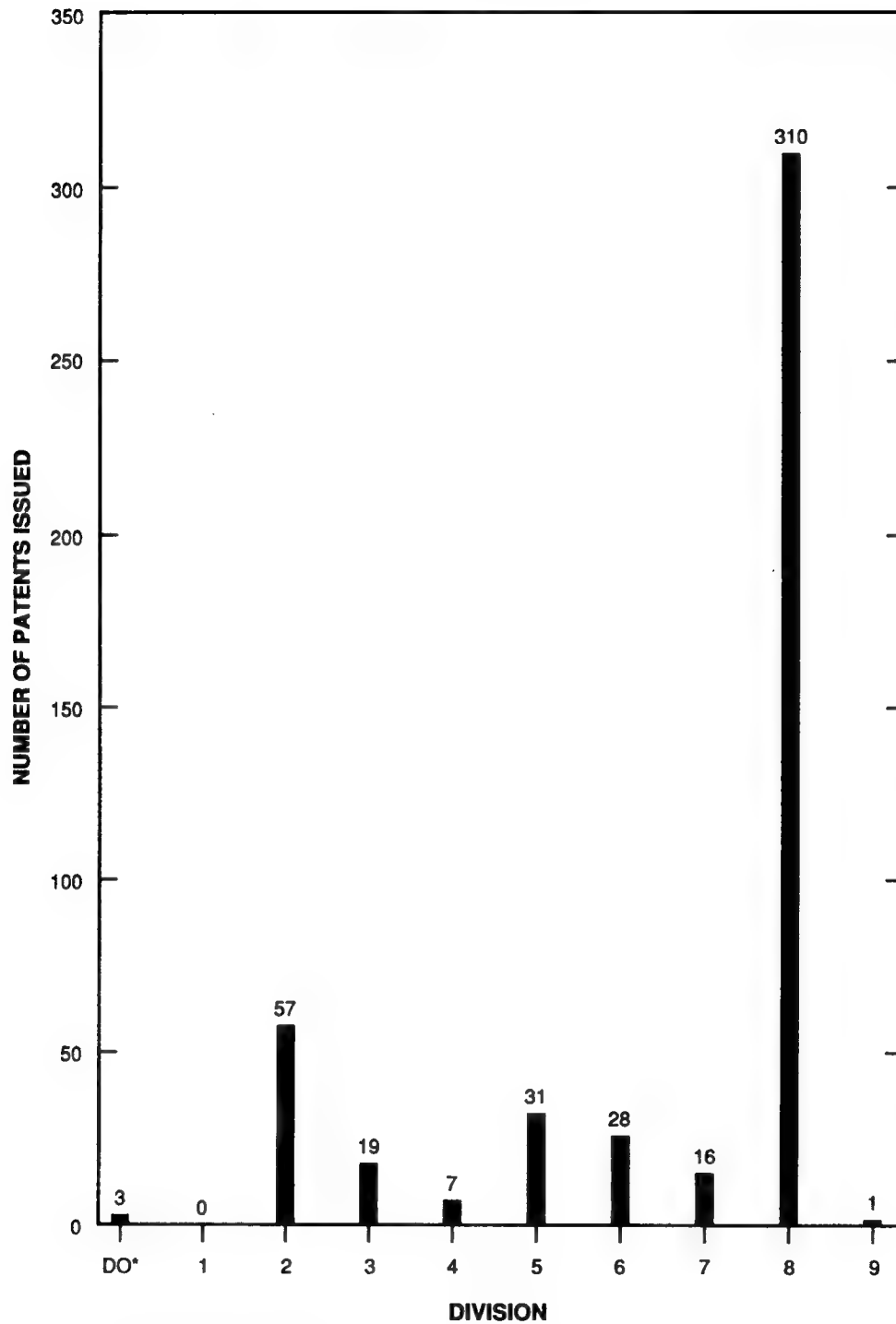
1956 - 1990

(by Year)



* Partial results

**MIT LINCOLN LABORATORY PATENTS
1956 - 1990
(by Division)**



* DIRECTOR'S OFFICE

LISTINGS OF BOOKS AND ARTICLES ON PATENTING AND LICENSING

BOOKS

NOTE Call numbers are for books in the Lincoln Laboratory Library. Books from the Library's collection may be borrowed by interlibrary loan. Direct orders to Interlibrary Loan Section, Library and Information Services, Room A-077, MIT Lincoln Laboratory, 244 Wood Street, Lexington, MA 02173-9108, 617-981-2781.

KF3114.8 .E54 A44 1986

PATENT LAW FOR THE NONLAWYER - A GUIDE FOR THE ENGINEER, TECHNOLOGIST, AND MANAGER
Amernick, B.A.

New York: Van Nostrand Reinhold
1986

KF2980 .B37 1990

COPYRIGHTS, PATENTS, AND TRADEMARKS - PROTECT YOUR RIGHTS WORLDWIDE
Barber, H.L.

Blue Ridge Summit, PA: Liberty House
1990

T339 .D38 1988

INVENTOR'S GUIDE TO SUCCESSFUL PATENT APPLICATIONS
DeForest, T.E.

Blue Ridge Summit, PA: Tab Books
1988

KF2979 .D67 1990

PROTECTING TRADE SECRETS, PATENTS, COPYRIGHTS, AND TRADEMARKS
Dorr, R.C. and C. Munch
New York: Wiley Law Publications
1990

TA174 .F64 1989

PROTECTING ENGINEERING IDEAS & INVENTIONS
Foltz, R.D. and T. Penn
3rd ed. Cleveland, OH: Penn Institute
1989

KF2980 .F67 1989

PATENTS, COPYRIGHTS & TRADEMARKS
Foster, F.H. and R.L. Shook
New York: Wiley
1989

T339 .J56 1987

HOW TO WRITE AN INVENTION DISCLOSURE

Joenk, R.J.

Piscataway, NJ: IEEE

1987

KF3114.8 .E54 W48 1989

WHAT EVERY ENGINEER SHOULD KNOW ABOUT PATENTS

Konold, W.G.

2nd ed. New York: M. Dekker

1988

KF3024 .C6 K88 1987

COMPUTER SOFTWARE - PROTECTION, LIABILITY, LAW, FORMS

Kutten, L.J.

New York: C. Boardman Co.

1987

T339 .L38 1990

INVENTING AND PATENTING SOURCEBOOK - HOW TO SELL AND PROTECT YOUR IDEAS

Levy, R.C. and R.J. Huffman

1st ed. Detroit, MI: Gale Research

1990

T171 .G789 1987

GUIDE TO THE OWNERSHIP, DISTRIBUTION, AND COMMERCIAL DEVELOPMENT OF MIT TECHNOLOGY: POLICIES AND PROCEDURES

Cambridge, MA: MIT

1987

KF2980 .M52 1990

INTELLECTUAL PROPERTY - PATENTS, TRADEMARKS, AND COPYRIGHT IN A NUTSHELL

Miller, A.R. and M.H. Davis

2nd ed. St. Paul, MN: West

1990

KF3102 .P37 1989

PATENT, TRADEMARK, AND COPYRIGHT LAWS

Samuels, J.M.

Washington, DC: Bureau of National Affairs

1989

T223 .J4 U54 1989

GENERAL INFORMATION CONCERNING PATENTS: A BRIEF INTRODUCTION TO PATENT MATTERS
U.S. Patents and Trademarks Office
Washington, DC: GPO
1989

Z253 .U581 1984

PATENTS AND TRADEMARKS STYLE MANUAL: A SUPPLEMENT TO THE UNITED STATES GOVERNMENT PRINTING OFFICE STYLE MANUAL
U.S. Patents and Trademarks Office
Washington, DC: GPO
1984

KF2979 .A2 O96 1989

OWNING SCIENTIFIC AND TECHNICAL INFORMATION - VALUE AND ETHICAL ISSUES
Weil, V. and J.W. Snapper
New Brunswick, NJ: Rutgers University Press
1989

JOURNAL ARTICLES

NOTE All articles are available from the Lincoln Laboratory Library. Direct orders to Interlibrary Loan Section, Library and Information Services, Room A-077, MIT Lincoln Laboratory, 244 Wood Street, Lexington, MA 02173-9108, 617-981-2781.

USING PATENT INFORMATION IN TECHNOLOGY BUSINESS PLANNING — I

Ashton, W.B. and R.K. Sen
RESEARCH TECHNOLOGY MANAGEMENT vol. 31, no. 6, pp. 42-46, November-December 1988

USING PATENT INFORMATION IN TECHNOLOGY BUSINESS PLANNING — II

Ashton, W.B. and R.K. Sen
RESEARCH TECHNOLOGY MANAGEMENT vol. 32, no. 1, pp. 36-42, January-February 1989

CULTIVATING INVENTION

Breton, E.J. and R.J. Gold
RESEARCH MANAGEMENT vol. 30, no. 5, pp. 9-12, September-October 1987

PATENT APPLICATIONS: NEED AND TIMING CAN BE AS CRITICAL AS VALIDITY

Carte, N.E.
HIGH TECHNOLOGY BUSINESS vol. 8, no. 12, pp. 14-15, December 1988

PATENT RIGHTS AT THE UNIVERSITY/INDUSTRY INTERFACE

Ditzel, R.G.
JOURNAL OF THE SOCIETY OF RESEARCH ADMINISTRATORS vol. 20, no. 1, pp. 221-228, Summer 1988

PATENTS AND THE PROGRESS OF SCIENCE: EXCLUSIVE RIGHTS AND EXPERIMENTAL USE

Eisenberg, R.S.

UNIVERSITY OF CHICAGO LAW REVIEW vol. 56, no. 3, pp. 1017-1086, Summer 1989

INNOVATION, IMAGINATION, AND INVENTION: THE THREE I'S OF CREATIVITY

Floyd, R.E.

INDUSTRIAL MANAGEMENT vol. 31, no. 3, pp. 22-24, May-June 1989

THE PERILS OF PATENT INFRINGEMENT

Foltz, R. and T.A. Penn

MACHINE DESIGN vol. 62, no. 7, pp. 105-108, 12 April 1990

PATENT AWARDS: FIRST TO FILE OR INVENT?

Giannetti, T.L.

DESIGN NEWS vol. 44, p. 184, 18 January 1988

WHO OWNS "YOUR" INVENTIONS?

Giannetti, T.L.

DESIGN NEWS vol. 43, p. 114, 21 December 1987

A PROGRAMMER'S RIGHT OF RENEWAL AND RIGHT OF TERMINATION OF TRANSFERS AND LICENSES UNDER COPYRIGHT

Haynes, M.A.

SOFTWARE PROTECTION vol. 8, no. 1, pp. 1-10, June 1989

SOFTWARE PROTECTION UNDER PATENT AND COPYRIGHT

Iandiorio, J.S.

IEEE TECHNOLOGY AND SOCIETY MAGAZINE vol. 7, no. 3, pp. 9-10, September 1988

WHO OWNS THE COPYRIGHTS?

McGrath, W.T.

BYTE vol. 15, no. 4, pp. 269-71, April 1990

PROTECTION THROUGH PATENTS: NEW POWER FOR AN OLD REMEDY

Meyerowitz, S.A.

BUSINESS MARKETING vol. 73, no. 7, pp. 62-67, July 1988

HOW TO PROTECT YOUR BRIGHT IDEA

Moreau, D.

CHANGING TIMES vol. 43, p. 63-66, August 1989

WHAT WE'VE LEARNED: MANAGING INVENTION AND INNOVATION

Roberts, E.B.

RESEARCH TECHNOLOGY MANAGEMENT vol. 31, no. 1, pp. 11-29, January-February 1988

MAKING PATENTS WORK FOR SMALL COMPANIES

Rothchild, R.D.

HARVARD BUSINESS REVIEW vol. 65, no. 4, pp. 24-30, July-August 1987

RESPONDING TO THE CHANGING PATENT SYSTEM

Shapiro, A.R.

RESEARCH TECHNOLOGY MANAGEMENT vol. 33, no. 5, pp. 38-43, September-October 1990

IT'S A MYTH THAT ALL INVENTIONS COME FROM OUTSIDE

Wise, G.

RESEARCH TECHNOLOGY MANAGEMENT vol. 32, no. 4, pp. 7-8, July-August 1989

MISSING INVENTORS OR INVENTIONS

If you know of inventors or inventions, past or present, not included in this book, please complete this form and return it to Mary L. Murphy, Room A-043, MIT Lincoln Laboratory Library, 244 Wood Street, Lexington, MA 02173-9108.

Thank you for your assistance.

INVENTOR: _____

PATENT TITLE: _____

PATENT NUMBER OR PATENT APPLICATION NUMBER: _____

DATE OF PATENT OR PATENT APPLICATION: _____

SIGNIFICANCE OR COMMERCIAL APPLICATION: _____

LICENSED TO: _____

YOUR NAME: _____

ADDRESS: _____

TELEPHONE NO.: _____

INVENTOR INDEX

ABOUZAHRA, M.D., 4,947,143	BUCK, D.A., 3,011,711
AGGARWAL, R.L., 3,869,618; 4,063,105	BURKE, B.E., 4,290,118; 4,291,390; 4,458,324
AHERN, B.S., 4,662,860	BURKE, R.L., 3,965,277; 4,150,177; 4,372,996
ALLEY, G.D., 4,378,629; 4,553,265	BURNS, J.A., 4,810,663
ANDERSON, A.C., 4,499,441	
ANTONIADIS, D., 4,565,599	CAFARELLA, J.H., 4,055,758; 4,101,965
ARNONE, C., 4,668,528	CALAWA, A.R., 3,167,663; 4,323,422
ARNOTT, R.J., 3,382,161	CAUNT, J.W., 4,501,966
AULL, B.F., 4,848,880	CHAPMAN, G.H., 4,585,490; 4,636,404; 4,810,663; 4,843,034
AUSTIN, S.S., 4,200,395; 4,340,305	CHAPMAN, R.L., 4,227,941; 4,248,675
AUTLER, S.H., 3,200,299	CHATTERTON, E.J., Jr., 3,590,248
	CHEN, C.K., 4,889,583
BACHNER, F.J., 4,337,990; 4,556,277; 4,721,349; 4,822,120	CHI, J-Y., 4,320,247
BAKER, R.H., 3,010,031	CHIANG, A.M., 4,458,324; 4,464,726
BERG, R.S., 3,448,421	CHOI, H-K., 4,700,461; 4,774,205
BERGERON, N.J., 4,839,310; 4,903,089	CLIFTON, B.J., 4,553,265
BERNACKI, S.E., 3,974,382; 4,119,855; 4,184,172; 4,231,819; 4,283,235	COHEN, A., 2,978,704
BERS, A., 4,055,758; 4,101,965	COHEN, M.S., Jr., 3,886,530
BIRON, D.G., 4,690,551	COVERT, E.E., 3,963,515
BIVANS, E.W., 3,037,195	COX, C.H. III, 4,444,992
BLACK, J.G., 4,756,927	CROWTHER, T.S., 3,515,606
BOZLER, C.O., 4,197,141; 4,227,941; 4,248,675; 4,376,228; 4,378,629; 4,420,873; 4,514,581; 4,518,219; 4,619,894; 4,727,047; 4,816,420; 4,837,182; 4,903,089	
BRAGA-ILLA, A.A., 3,521,835	DALOMBA, M.A., 4,170,512; 4,254,174
BRUECK, S.R.J., 4,107,544; 4,220,510	DAVIS, F.M., 4,632,712
	DAVIS, P., 2,978,704

INVENTOR INDEX

DEUTSCH, T.F., 4,340,617; 4,608,117;
4,615,904

DIADIUK, V., 4,746,620

DIMMOCK, J.O., 3,497,698; 3,746,867;
3,748,593; 3,794,844

DOLAT, V.S., 4,672,254

DONNELLY, J.P., 4,166,669; 4,881,237

EDWARDS, B.E., 4,690,551

EFREMOW, N., JR., 4,734,152

EHRlich, D.J., 4,340,617; 4,608,117;
4,615,904; 4,619,894; 4,668,528;
4,672,254; 4,748,045; 4,756,927;
4,834,834; 4,868,005

FAN, J.C.C., 4,038,216; 4,059,461;
4,115,228; 4,197,141; 4,227,941;
4,248,675; 4,248,687; 4,309,225;
4,312,915; 4,337,990; 4,357,183;
4,366,338; 4,371,421; 4,376,228;
4,442,166; 4,514,581; 4,547,622;
4,556,277; 4,632,712; 4,670,088;
4,721,349; 4,727,047; 4,816,420;
4,822,120; 4,837,182; 4,839,145;
4,853,076

FANO, R.M., 2,982,852

FELDMAN, J.A., 4,710,959

FERRETTI, A., 3,382,161

FISHER, R.A., 3,720,884

FLANDERS, D.C., 4,170,512; 4,200,395;
4,254,174; 4,256,787; 4,287,235;
4,340,305; 4,360,586; 4,370,194;
4,565,599; 4,618,261; 4,722,092;
4,777,148

FOLINO, F.A., 4,454,371

FORMAN, S.E., 4,501,966

FORRESTER, J.W., 2,736,880

FOYT, A.G., 4,525,871

GALE, R.P., 4,357,183; 4,547,622;
4,632,712; 4,839,145

GANZ, M.W., 4,959,653

GATOS, H.C., 3,879,235; 3,887,937;
4,011,745; 4,186,045; 4,320,247

GEIS, M.W., 4,371,421; 4,479,846;
4,565,599; 4,670,088; 4,734,152;
4,853,076

GOODENOUGH, J.B., 4,049,891

GOODHUE, W.D., 4,839,310; 4,848,880

GORMLEY, J.V., 4,323,422

GORSKI-POPIEL, G., 4,426,712

GREEN, P.E., JR., 2,982,853

GREENWOOD, D.P., 4,798,437

GREIFF, P., 4,067,037

GROVES, S.H., 4,746,620

GUDITZ, E.A., 3,965,277; 4,150,177;
4,372,996

GUHN, D.K., 4,473,805

GUPTA, K.C., 4,947,143

GUSTAFSON, T.K., 3,720,884

HALDEMAN, C.W., 3,963,515

HARMAN, T.C., 4,642,142

HARNEY, R.C., 4,298,280; 4,352,105

HARTE, K.J., 3,500,354

INVENTOR INDEX

HAUS, H.A., 4,342,970
 HENRICH, V.E., 4,038,216; 4,115,228
 HENSHAW, P.D., 4,508,431
 HERNDON, T.O., 4,027,383; 4,843,034
 HOFSTETTER, E.M., 4,710,959
 HOLLIS, M.A., 4,839,310; 4,903,089
 HONG, H.Y-P., 4,049,891; 4,117,103;
 4,172,882
 HOWLAND, B., 3,448,421; 3,619,067;
 4,140,369; 4,257,690; 4,274,737
 HSIEH, J.J., 4,142,924; 4,258,375;
 4,287,485; 4,372,791
 HSU, J.P., 4,511,216
 HSU, M.S., 4,087,976; 4,490,445;
 4,511,216; 4,614,628; 4,644,751
 HUBER, E.E., Jr., 3,886,530
 HURWITZ, C.E., 4,258,375

 INGEBRIGTSEN, K.A., 4,066,984;
 4,101,965
 ISLER, G.W., 4,662,860

 JAIN, K., 4,382,660
 JARVINEN, P.O., 4,567,110
 JASTRZEBSKI, L.L., 4,186,045

 KALATA, K., 4,791,490
 KEICHER, W.E., 4,489,390
 KELLEY, P.L., 3,720,884
 KELSALL, D., 3,912,394

KEYES, R.J., 3,950,645
 KILDAL, H., 4,107,544
 KINGSTON, R.H., 3,077,578; 4,696,533;
 4,865,427
 KNIGHT, F.K., 4,791,490
 KOLM, C.R., 2,990,259
 KOLM, H.H., 2,994,808; 3,703,958;
 3,768,417; 3,842,751; 3,871,301
 KUNNMANN, W., 3,382,161

 LAGOWSKI, J., 3,887,937; 4,011,745
 LATTES, A.L., 4,342,970
 LAX, B., 3,655,986; 3,869,618;
 4,063,105
 LEE, J.C., 4,558,290
 LEE, N.K., 4,063,105; 4,838,685
 LEGER, J.R., 4,649,351; 4,813,762
 LEONBERGER, F.J., 4,166,669;
 4,376,285; 4,420,873; 4,518,219;
 4,525,871; 4,696,533; 4,798,437;
 4,865,427
 LERNER, R.M., 3,831,173
 LEVINE, J.S., 4,093,927
 LIAU, Z-L., 4,468,850; 4,718,070;
 4,722,092; 4,777,148; 4,784,722;
 4,894,840
 LICHTENSTEIGER, M., 3,879,235
 LINDLEY, W.T., 4,378,629; 4,458,324
 LYNCH, J.T., 4,499,441
 LYSZCZARZ, T.M., 4,618,261

INVENTOR INDEX

MANFRA, M.J., 4,323,422

MARCUS, S., 4,447,149

MARTINEZ, D.M., 4,838,685

McAULAY, R.J., 4,856,068; 4,885,790;
4,937,873

McCLELLAND, R.W., 4,227,941;
4,248,675; 4,420,873; 4,518,219;
4,727,047; 4,816,420; 4,837,182

McMAHON, R.E., 3,281,802; 3,488,644;
3,818,243

McMULLIN, P.G., 3,871,215; 3,897,766

McWHORTER, A.L., 3,077,578

MELNGAILIS, I., 3,167,663; 3,748,593;
3,794,844; 4,420,873; 4,518,219

MELNGAILIS, J., 4,268,808; 4,342,970

MILLNER, A.R., 4,268,095

MOODY, P.L., 2,990,259

MOORADIAN, A., 4,860,304

MORROW, W.E., JR., 3,521,835;
4,087,976

MUNROE, S.C., 4,298,953

MURPHY, R.A., 4,378,629

NAIMAN, M.L., 4,585,490; 4,810,663

NICHOLS, K.B., 4,839,310; 4,903,089

O'DONNELL, F.J., 4,376,285

O'LEARY, G.C., 4,742,510

OATES, D.E., 4,609,890

OPPENHEIM, A.V., 3,518,578

ORABONA, J.F., 2,978,704

OSGOOD, R.M., JR., 4,220,510;
4,340,617; 4,608,117; 4,615,904

PANG, S.W., 4,734,152

PARENTI, R.R., 4,489,390

PHELAN, R.J., JR., 3,497,698;
3,568,087; 3,649,838; 3,746,867

POLLARD, E.R., 3,625,660

PRATT, G.W., JR., 3,676,795;
3,871,017; 3,871,215; 3,897,766;
3,927,385; 3,941,670; 3,974,412;
4,020,388; 4,087,719; 4,115,280;
4,382,660

PRICE, R., 2,982,853

PROLL, A.F., 3,619,067

QUATIERI, T.F., 4,742,510; 4,856,068;
4,885,790; 4,937,873

QUIST, T.M., 4,447,149

RADER, C.M., 3,395,345; 4,794,556

RAFFEL, J.I., 3,493,943; 3,495,224;
4,027,383; 4,127,900; 4,184,172;
4,231,819; 4,242,736; 4,283,235;
4,384,299; 4,585,490; 4,636,404;
4,810,663

RALSTON, R.W., 3,863,070; 4,290,118;
4,291,390; 4,313,178; 4,652,926

REDIKER, R.H., 2,975,342; 3,167,663;
3,568,087; 3,636,471; 4,479,224;
4,798,437

REED, T.B., 3,324,334; 3,625,660;
3,626,154; 3,857,990

INVENTOR INDEX

ROGERS, D.B., 3,382,161

ROTHSCHILD, M., 4,668,528; 4,748,045;
4,834,834; 4,868,005

ROTSTEIN, J., 3,950,645

SALERNO, J.P., 4,366,338

SALTZER, J.H., 4,438,520

SCHLOSSBERG, H., 4,608,117;
4,615,904

SCOTT, M.L., 4,813,762

SHAVER, D.C., 4,256,787; 4,370,194

SHOAP, S.D., 4,313,159

SMITH, D.O., 3,393,957; 3,500,354;
3,516,080; 3,566,383; 3,886,530

SMITH, H.I., 3,742,229; 3,742,230;
3,743,842; 3,984,680; 4,075,706;
4,170,512; 4,200,395; 4,254,174;
4,256,787; 4,333,792; 4,340,305;
4,360,586; 4,370,194; 4,479,846;
4,565,599

SMITH, W.W., 3,425,051

SMYTHE, D.L., JR., 4,290,118;
4,291,390

SOLLNER, T.C.L.G., 4,745,452;
4,831,340

SPEARS, D.L., 3,742,229; 3,742,230;
3,743,842

STEININGER, J., 3,857,990

STERN, E., 3,742,229; 3,742,230;
3,743,842; 3,789,327; 3,883,831;
4,016,412; 4,055,758; 4,066,984;
4,075,706; 4,290,118; 4,291,390;
4,313,178; 4,652,926

STOCKHAM, T.G., JR., 3,518,578

STRAUSS, A.J., 3,748,593; 3,794,844

SWANSON, G.J., 4,649,351; 4,895,790

THORNTON, R.D., 3,768,417; 3,842,751;
3,871,301

TSANG, D.Z., 4,563,765

TSAO, J.Y., 4,619,894; 4,672,254

TSAUR, B-Y., 4,371,421; 4,632,712;
4,670,088; 4,700,461; 4,774,205;
4,853,076; 4,864,378; 4,889,583

TURNER, G.W., 4,366,338; 4,774,205

VELDKAMP, W.B., 4,410,237; 4,649,351;
4,813,762; 4,895,790

WALDRON, R.A., 3,789,327

WALPOLE, J.N., 4,468,850; 4,563,765;
4,718,070; 4,722,092; 4,777,148;
4,784,722; 4,894,840

WEISS, J.A., 3,289,110; 3,304,519

WELFORD, D., 4,893,352

WHEELER, R.H., 3,863,070

WILLIAMSON, R.C., 3,883,831;
4,016,412; 4,055,758; 4,075,706;
4,525,871

WILSON, C.F., 4,614,628

WITHERS, R.S., 4,499,441; 4,652,926

WITT, A.F., 3,879,235

WRIGHT, P.V., 4,499,441; 4,609,890

INVENTOR INDEX

YASAITIS, J.A., 4,127,900; 4,242,736;
4,384,299; 4,585,490; 4,636,404;
4,810,663

ZEIGER, H.J., 4,059,461; 4,309,225

SUBJECT INDEX

ABERRATION COMPENSATION LENS

4,798,437

ABERRATION CORRECTION

4,798,437

ABSORBING MATERIALS

4,511,216

ABSORPTION

4,511,216

ACCESS APPARATUS

4,313,159

ACOUSTIC WAVE DEVICES

4,055,758; 4,101,965; 4,268,808;

4,342,970

ACOUSTIC WAVEFORMS

4,885,790; 4,937,873

ACOUSTIC WAVES

4,055,758; 4,075,706

ACOUSTO-OPTICS

4,690,551

ADAPTIVE NULLING

4,959,653

ADAPTIVE SIDELOBE BLANKER

4,959,653

AIR GAPS

4,268,095

AIRFOILS

3,963,515

ALIGNMENT

4,200,395

ALKALI-METAL-ION TRANSPORT

4,049,891

ALUMINUM

4,372,996

ALUMINUM OXIDE FILM

4,619,894

AMORPHOUS MATERIALS

4,309,225

AMORPHOUS SILICON

4,376,228; 4,514,581

AMPLIFIERS

3,425,051

ANALOG DEVICES

4,458,324

ANALOG OPTICAL WAVE SIGNALS

4,798,437

ANALOG SIGNAL SAMPLING

4,794,556

ANALOG SOLID STATE MEMORY

4,291,390; 4,313,178

ANALOG-TO-DIGITAL CONVERSION

3,425,051

ANGULAR VELOCITY

3,871,215; 3,897,766

ANISOTROPIC DRY ETCHING

4,734,152

ANISOTROPIC ETCHING

4,734,152

ANODIZATION

4,227,941; 4,248,675

ANTENNA CONTROLLER

4,959,653

ANTENNA DESIGN

3,831,173

ANTENNA SIGNALS

4,959,653

ANTENNAS

2,978,704

ANTI-MULTIPATH SYSTEM

2,982,852; 2,982,853

SUBJECT INDEX

ANTIREFLECTION COATINGS
4,227,941; 4,248,675; 4,444,992

ARC DISCHARGE
3,974,412

ARCS
4,087,719

ARRAY
3,077,578; 3,500,354; 4,066,984;
4,101,965

ASSOCIATIVE MEMORY
3,493,943

AUDIO PREPROCESSING
4,856,068

AUTOMATIC FOCUSING SYSTEMS
4,798,437

AUTOMOBILES
3,871,215; 3,897,766

AVALANCHE PHOTODIODES
4,258,375

AXIAL ARRAYS
4,027,383

BANDGAP
3,748,593

BANDPASS FILTERS
3,883,831

BEAM FORMING
4,410,237

BEAM PATH
4,093,927

BEAMS
3,568,087; 3,655,986; 3,676,795;
3,912,394

BIAS VOLTAGE
4,298,953

BIOLOGICAL AND CHEMICAL ACTIVITY
3,941,670; 4,115,280

BIT STORAGE
3,516,080

BORON NICKEL
4,372,996

BRAZED JOINTS
4,567,110

BROADBAND
4,558,290

BUFFER
4,290,118

BULK ACOUSTIC WAVE
4,268,808; 4,342,970; 4,609,890

BURIED CHANNEL CHARGE COUPLED
DEVICE
4,696,533; 4,865,427

BURIED HETEROSTRUCTURE LASERS
4,777,148

BURIED LAYER DOUBLE
HETEROSTRUCTURE LASER
4,777,148

CADMIUM TELLURIDE
4,642,142

CAPACITOR CELLS
4,127,900; 4,242,736; 4,384,299

CAPACITOR MEMORIES
4,127,900; 4,242,736; 4,384,299

CAPACITORS
3,818,243

CAPPING TECHNIQUE
4,889,583

CATHODES
3,625,660

SUBJECT INDEX

CERAMICS

4,115,228; 4,567,110

CERMET FILMS

4,038,216; 4,115,228; 4,312,915;
4,442,166

CHANNEL TRACKING

4,426,712

CHARGE DOMAIN MULTIPLYING DEVICES

4,458,324

CHARGE DOMAIN PARALLEL PROCESSING NETWORK

4,464,726

CHARGE-COUPLED DEVICES

4,290,118; 4,291,390; 4,313,178;
4,458,324; 4,464,726; 4,696,533;
4,865,427

CHEMICAL VAPOR DEPOSITION

4,839,145

CHEMICAL VAPOR DEPOSITION REACTOR

4,839,145

CHROMIUM OXIDE THIN FILMS

4,748,045

CIRCUITRY

3,200,299; 4,184,172; 4,231,819

CIRCULATORS

3,304,519

COAXIAL WAVEGUIDE JUNCTION

4,558,290

COBALT THIN FILMS

4,748,045; 4,868,005

COHERENT BEAM COMBINING

4,813,762

COHERENTLY ADDED LASER BEAMS

4,649,351

COILS

3,200,299; 3,488,644

COLLECTORS

4,231,819

COLLIMATED LASER BEAM

4,618,261

COMMUNICATION SYSTEMS

2,982,852; 2,982,853

COMMUNICATIONS RING

4,438,520

COMPLEX ELECTRICAL SIGNAL

3,395,345

COMPLEX WAVEFORM

3,395,345

COMPOSITE FILMS

4,337,990; 4,721,349; 4,822,120

COMPRESSION

3,518,578

COMPRESSION RATIO

3,720,884

COMPUTERS

2,975,342; 3,011,711

CONDUCTIVE FINGER

4,290,118

CONDUCTIVE MATERIAL

3,703,958

CONDUCTIVE PATH

4,585,490; 4,810,663; 4,843,034

CONDUCTIVITY

3,448,421

CONDUCTORS

3,965,277; 4,027,383; 4,093,927;
4,117,103; 4,172,882; 4,268,095

CONTENT-ADDRESSED MEMORY SYSTEM

3,500,354

SUBJECT INDEX

- CONTROL SIGNALS
4,352,105
- CONTROL SYSTEMS
3,521,835
- CONTROL WIRES
3,011,711
- CORONA DISCHARGE
3,974,412; 4,087,719
- CORRELATORS
4,290,118; 4,298,953; 4,426,712
- COUPLED QUANTUM WELLS
4,745,452
- COUPLERS
4,268,808; 4,342,970
- COUPLING
4,499,441
- COVARIANCE MATRIX
4,959,653
- CRUCIBLES
3,625,660
- CRYOGENIC COMPUTING DEVICES
3,011,711
- CRYOGENIC LIQUIDS
4,220,510
- CRYOGENICS
4,220,510; 4,499,441
- CRYOTRONS
3,011,711
- CRYSTAL DISPLAY DEVICE
4,256,787; 4,370,194
- CRYSTAL GROWTH
3,382,161; 3,625,660; 3,857,990;
3,879,235; 4,142,924; 4,186,045;
4,333,792; 4,420,873; 4,662,860;
4,727,047; 4,837,182
- CRYSTAL ORIENTATION
4,333,792
- CRYSTAL SUBSTANCES
4,342,970
- CRYSTAL SUBSTRATES
4,268,808; 4,378,629
- CRYSTALLINE DIODES
3,927,385
- CRYSTALLINE LAYERS
4,727,047; 4,816,420; 4,837,182
- CRYSTALLINE SHEETS
4,837,182
- CRYSTALLINE STRUCTURE
4,049,891; 4,479,846
- CRYSTALLINE TANDEM CELLS
4,816,420
- CRYSTALLINITY
4,059,461
- CRYSTALLIZATION
4,309,225; 4,670,088; 4,853,076
- CURRENTS
3,879,235; 4,186,045
- CW LASER
4,690,551
- CYLINDRICAL SPACE
3,857,990
- CZOCHEWSKI CRYSTAL GROWTH
4,662,860
- DATA COMMUNICATION
4,742,510
- DATA FILTERING SYSTEM
3,037,195
- DATA PROCESSING
3,037,195

SUBJECT INDEX

DATA SIGNALS

3,037,195

DATA STORAGE

4,313,159

DECODING

4,438,520

DELAY LINES

3,720,884; 4,464,726

DEPOSITION

4,248,687

DETECTORS

4,473,805; 4,791,490

DIELECTRIC CONSTANT

4,798,437

DIELECTRIC ISOLATION

4,184,172; 4,231,819; 4,283,235

DIELECTRICS

4,067,037

DIFFERENTIAL PHASE SHIFTER

3,304,519

DIFFRACTED BEAM

4,340,305

DIFFRACTION GRATINGS

4,200,395; 4,649,351

DIFFRACTIVE COUPLING

4,813,762

DIFFRACTIVE LENSLET ARRAY

4,813,762

DIFFRACTIVE OPTICAL ELEMENTS

4,895,790

DIGITAL DATA PROCESSORS

3,010,031

DIGITAL DEVICES

4,458,324

DIGITAL INFORMATION

3,281,802

DIGITAL STORAGE DEVICE

2,736,880

DIODE LASERS

4,563,765

DIODES

3,077,578; 4,287,485

DIRECT WRITING

4,748,045; 4,756,927

DIRECTED ENERGY BEAM

4,834,834

DISCHARGE DEVICE

4,020,388

DISLOCATION AND CRYSTALLINE

DEFECTS ENTRAINMENT

4,479,846

DISLOCATION DENSITIES

4,632,712

DISPLAY SYSTEMS

4,352,105

DISTRIBUTED FEEDBACK

4,722,092

DISTRIBUTED FEEDBACK LASER

4,777,148

DOUBLE HETEROSTRUCTURE

4,372,791; 4,468,850; 4,722,092;

4,777,148

DOUBLE HETEROSTRUCTURE LASERS

4,784,722; 4,894,840

DOUBLE SIDEBAND MIXER

4,553,265

DRY ETCHING PATTERNING

4,734,152

SUBJECT INDEX

DYNAMIC RANGE

3,518,578

DYNAMIC RANGE COMPRESSION

4,856,068

ECHO CANCELLER

4,742,510

EDDY CURRENT APPARATUS

3,703,958

ELASTIC WAVES

3,789,327; 3,883,831

ELECTRIC ARC

3,324,334

ELECTRIC ENERGY

3,324,334

ELECTRIC FIELDS

4,020,388; 4,087,719; 4,140,369;
4,256,787; 4,370,194

ELECTRICAL CONTACTS

4,248,675

ELECTRICAL ENERGY TRANSPORT

4,947,143

ELECTRICAL MATERIALS

4,734,152

ELECTRICAL RESPONSE

3,746,867

ELECTRICAL TERMINALS

2,736,880

ELECTRICALLY CONDUCTIVE

FRAMEWORK

2,978,704

ELECTROCHEMISTRY

4,490,445

ELECTRODE COVERING

4,444,992

ELECTRODES

4,087,719; 4,197,141

ELECTROLYTIC CELL

4,087,976; 4,197,141

ELECTROLYTIC SEPARATION

3,382,161

ELECTROMAGNET

3,200,299

ELECTROMAGNETIC BEAMS

4,410,237

ELECTROMAGNETIC ENERGY

3,568,087; 3,869,618

ELECTROMAGNETIC RADIATION

3,655,986; 3,863,070

ELECTROMAGNETIC RADIATION

DETECTOR

4,745,452

ELECTROMAGNETIC WAVE SIGNAL

4,848,880; 4,865,427

ELECTROMAGNETIC WAVES

3,289,110; 4,410,237

ELECTROMAGNETICS

3,167,663; 3,768,417; 3,842,751;
3,974,412

ELECTROMIGRATION

4,186,045

ELECTRON BEAMS

3,516,080; 3,566,383

ELECTRON MOBILITY

4,853,076

ELECTRONIC BANDS

2,994,808

ELECTROOPTICAL DEVICES

4,696,533; 4,848,880

SUBJECT INDEX

EMISSIVITY
4,312,915; 4,357,183; 4,442,166

EMITTER GEOMETRIES
4,184,172

EMITTERS
4,067,037

ENCAPSULATION
4,565,599

ENCODING
2,982,852; 4,438,520

ENERGY CONSERVATION
4,454,371

ENERGY CONVERSION
4,320,247; 4,614,628

ENERGY GAP
3,871,017

ENERGY STATES
3,568,087; 3,655,986

ENHANCED RADIATION
3,636,471

EPITAXIAL GROWTH
3,879,235; 4,142,924; 4,186,045;
4,333,792; 4,357,183; 4,371,421;
4,420,873; 4,632,712; 4,670,088;
4,727,047; 4,837,182

EPITAXIAL LAYER
3,879,235; 4,166,669; 4,468,850

EPITAXY
4,333,792

ERROR CORRECTING
3,818,243

ETCH SOLUTION
4,323,422

ETCHING
4,150,177; 4,231,819; 4,468,850

EXTERNAL CAVITY LASERS
4,479,224

EYE TESTING CHART
4,257,690

FABRICATION
2,978,704; 4,038,216; 4,067,037;
4,115,228; 4,170,512; 4,242,736;
4,254,174; 4,287,235; 4,287,485;
4,372,791; 4,376,285; 4,378,629;
4,420,873; 4,614,628

FAR ECHO
4,742,510

FAST FOURIER TRANSFORM
4,937,873

FAST-SWEEP GROWTH
4,142,924

FEEDBACK
3,425,051

FERRITE CORE
2,736,880; 3,495,224

FIBER OPTIC ARRAY
4,791,490

FIBER OPTICS
4,791,490

FIBER-COUPLED SEMICONDUCTOR
LASER
4,479,224

FIBERS
3,590,248; 3,619,067

FILM
4,565,599

FILM DEPOSITION
4,748,045

FILTERED VALUE MATRIX
4,489,390

SUBJECT INDEX

FLOATING GATE TAPPING

4,298,953

FOSSIL FUELS

4,644,751

FOUR WAVE MIXING

4,107,544

FOURIER ANALYSIS

4,937,873

FREQUENCY SHIFTING

4,690,551

FREQUENCY SOURCE OSCILLATOR

4,831,340

FUEL CELLS

4,087,976; 4,614,628; 4,644,751

FUEL-AIR MIXTURE

4,020,388

FUELS

4,490,445

FURNACES

3,626,154

GALLIUM ARSENIDE

2,990,259; 4,142,924; 4,734,152;
4,839,145

GALLIUM ARSENIDE MESFETS

4,774,205

GALLIUM INDIUM ARSENIDE

PHOSPHIDE

4,258,375; 4,287,485; 4,718,070;
4,722,092

GALLIUM INDIUM ARSENIDE

PHOSPHIDE INDIUM PHOSPHIDE

4,777,148; 4,784,722; 4,894,840

GALLIUM INDIUM ARSENIDE

PHOSPHIDE/INDIUM PHOSPHIDE DEVICES

4,468,850

GAP MEASUREMENT

4,618,261

GAP SURFACE

4,376,285

GARNETS

3,566,383

GAS LASERS

4,093,927

GASES

3,324,334; 4,490,445

GATE CHAIN

4,184,172; 4,231,819

GATE CONTROLLED TRANSISTOR

4,839,310

GATING DEVICES

3,011,711

GAUSSIAN ENERGY

4,410,237

GERMANIUM/SILICON

4,357,183

GLASS SUBSTRATE

4,254,174

GLOBAL POSITION RECEIVER

4,426,712

GRAIN BOUNDARIES

4,366,338

GRAPHOEPITAXY

4,565,599

GROUND RADAR

3,831,173

SUBJECT INDEX

GROWTH MASK
4,727,047; 4,816,420; 4,837,182

GUIDED VEHICLES
3,768,417; 3,842,751

HARMONIC MULTIPLIER
4,831,340

HEAT EXCHANGERS
4,490,445

HEAT MIRRORS
4,337,990; 4,556,277

HEAT PIPE FURNACE
3,857,990

HEAT SOURCES
4,087,976

HETERODYNE DETECTION
4,447,149

HETERODYNE DETECTOR ARRAY
4,298,280

HETEROEPITAXY
4,357,183

HETEROJUNCTIONS
3,927,385

HETEROSTRUCTURE
4,563,765

HETEROSTRUCTURE DIODE LASER
4,718,070; 4,784,722; 4,894,840

HETEROSTRUCTURE LASERS
4,287,485; 4,468,850

HIGH-CONTRAST X-RAY MASKS
4,287,235

HIGH-EFFICIENCY OPTICAL ELEMENTS
4,895,790

HIGH-ELECTRON MOBILITY
TRANSISTOR
4,839,310

HIGH-FLUX DENSITY APPARATUS
2,994,808

HIGH FREQUENCY
3,324,334

HIGH-FREQUENCY CIRCULATOR
3,304,519

HIGH-FREQUENCY LIGHT MODULATOR
3,393,957

HIGH-FREQUENCY PHONON
GENERATING APPARATUS
3,871,017

HIGH-FREQUENCY RADIO WAVES
3,289,110

HIGH-FREQUENCY TRANSISTORS
4,067,037

HIGH-FREQUENCY WAVE CONDUCTING
DEVICE
3,304,519

HIGH-MOBILITY TRANSISTOR
4,839,310

HIGH-POWER LASER
4,511,216

HIGH-POWER TUNABLE FAR-INFRARED
SOURCE
3,869,618

HIGH-TEMPERATURE JOINTS
4,567,110

HOLOGRAPHIC GRATING
4,609,890

HOT JET ETCHING
4,734,152

SUBJECT INDEX

HYBRID DEVICES

4,881,237

HYDROGEN STORAGE

4,087,976

HYDROPLANES

4,323,422

HYSTERESIS LOOPS

3,488,644; 3,495,224; 4,242,736;
4,384,299

IMAGE INTENSITY

4,838,685

IN-PHASE COMPONENTS

4,794,556

INCIDENT RADIATION

3,649,838

INDIRECT-GAP SEMICONDUCTOR

3,636,471

INDIUM ARSENIDE

2,990,259

INDIUM PHOSPHIDE

2,990,259; 4,287,485; 4,376,285;
4,722,092

INDUCTORS

3,448,421

INFORMATION PROCESSING

4,794,556

INFRARED DETECTION TUBE

3,950,645

INFRARED LASERS

4,107,544; 4,298,280

INFRARED MICROSCOPE INSPECTION

APPARATUS

4,501,966

INFRARED RADAR

4,352,105

INFRARED RADAR SYSTEMS

4,298,280

INFRARED RADIATION

3,626,154; 3,863,070

INFRARED REFLECTIVITY

4,312,915; 4,337,990; 4,442,166

INJECTION PLASMA

3,167,663

INPUT SIGNAL

3,518,578

INPUT-OUTPUT

3,167,663; 4,473,805

INSULATING SUBSTRATE

3,497,698

INSULATOR

3,497,698; 4,420,873

INSULATOR MATERIAL

3,886,530

INTEGRATED CIRCUIT CHIPS

3,965,277; 4,372,996

INTEGRATED CIRCUIT DEVICES

4,810,663

INTEGRATED CIRCUIT TRANSISTORS

4,283,235

INTEGRATED CIRCUITS

4,027,383; 4,372,996; 4,378,629;
4,810,663; 4,843,034

INTEGRATED FUEL CELL

4,644,751

INTERCONNECTS

4,756,927

SUBJECT INDEX

INTERFACES
3,886,530; 4,186,045; 4,290,118

INTERFERENCE SIGNALS
4,959,653

INTERFEROMETRIC MEASUREMENTS
3,912,394

INTERLAYER CONDUCTIVE PATH
4,843,034

INTERMETALLIC COMPOUNDS
4,868,005

INTERRUPTED GROWTH
4,632,712

INTRACAVITY-LOSS-MODULATED
4,563,765

ION BEAM SPUTTERING
4,248,687

IRIDIUM PLATINUM SILICIDE
4,864,378

IRIDIUM SILICIDE SCHOTTKY IR
DETECTORS
4,864,378

IRRADIATION
3,941,670; 4,115,280

ISOTOPE SEPARATION
4,220,510

ISOTOPES
4,220,510

JUNCTION FIELD EFFECT TRANSISTOR
4,700,461

JUNCTIONS
2,975,342

KERR CELL
3,720,884

KERR LIQUID
3,720,884

LASER APPLICATIONS
4,063,105

LASER ARRAY
3,590,248; 4,881,237

LASER BEAM SCANNER
4,059,461

LASER BEAMS
3,869,618; 3,941,670; 4,063,105;
4,115,280; 4,200,395; 4,340,305;
4,410,237; 4,511,216; 4,585,490

LASER BEAMSTEERING
4,508,431

LASER DEPOSITION
4,868,005

LASER DEVICES
3,655,986

LASER DIRECT WRITING
4,756,927

LASER DUMP
4,511,216

LASER MIXING
4,107,544

LASER PHOTOCHEMICAL ETCHING
4,672,254; 4,834,834

LASER PHOTODISSOCIATION
4,608,117; 4,615,904

LASER PULSES
3,720,884; 4,810,663

SUBJECT INDEX

LASER RADAR

4,447,149; 4,690,551

LASER SOURCES

4,340,617

LASERS

3,382,161; 3,655,986; 3,748,593;
3,794,844; 4,093,927; 4,287,485;
4,372,791; 4,468,850; 4,479,224;
4,508,431; 4,722,092; 4,810,663;
4,813,762

LATERAL EPITAXIAL GROWTH

4,371,421; 4,670,088

LATERAL LINKS

4,636,404

LATERAL P-I-N PHOTODETECTORS

4,746,620

LEAD

4,734,152

LEAD CONNECTIONS

4,027,383

LENS EVALUATION

4,274,737

LENSES

3,619,067; 4,274,737

LIGHT DETECTOR

3,619,067

LIGHT DIFFUSER

4,140,369

LIGHT EMITTING DIODE

3,927,385

LIGHT GUIDE

3,619,067

LINEAR LASER ARRAYS

4,881,237

LINEAR MOTOR

3,871,301

LINEAR PREDICTIVE VOCODING

4,710,959

LIQUID CRYSTALS

4,256,787; 4,370,194

LIQUID MIXERS

4,107,544

LIQUID PHASE EPITAXY

4,142,924; 4,287,485

LITHIUM ION TRANSPORT COMPOSITION

4,117,103; 4,172,882

LITHIUM SALTS

4,117,103; 4,172,882

LITHOGRAPHIC MASK ATTRACTION

3,974,382

LITHOGRAPHY

3,742,229; 3,984,680; 4,119,855;
4,170,512; 4,254,174

LOCAL OXIDATION OF SILICON

4,700,461

LOGARITHMS

3,518,578

LOGIC CIRCUITS

4,382,660

LOW CURRENTS

4,067,037

LOW POWER

4,585,490

LOW-POWER LASER PULSE

4,810,663

LOW-RESISTANCE LATERAL LINKS

4,636,404

LOW VIBRATION

4,662,860

SUBJECT INDEX

MACROMOLECULAR SPECIES

3,941,670; 4,115,280

MAGNETIC BEARING

4,268,095

MAGNETIC CHARACTERISTICS OF FILMS

3,515,606

MAGNETIC CORES

2,736,880; 3,281,802; 3,448,421;
3,488,644

MAGNETIC DEFLECTION

3,167,663

MAGNETIC DIPOLES

3,768,417; 3,842,751

MAGNETIC FIELDS

2,994,808; 3,011,711; 3,493,943;
3,703,958

MAGNETIC FILM MEMORIES

3,495,224; 3,500,354; 3,516,080;
3,566,383

MAGNETIC FILMS

3,393,957; 3,493,943

MAGNETIC MEMORY

2,736,880; 3,281,802; 3,488,644

MAGNETIC PROPERTIES

3,515,606

MAGNETOOPTICAL EFFECTS

3,393,957; 3,500,354; 3,516,080

MAGNETOOPTICS

3,566,383

MAGNETO-SEMICONDUCTOR DEVICES

3,167,663

MAGNETORESISTANCE

3,493,943

MASERS

3,382,161

MASK

3,743,842; 4,119,855

MASK-TO-SUBSTRATE GAP

4,618,261

MASKLESS ETCHING

4,834,834

MASKLESS FILM GROWTH

4,608,117; 4,615,904

MASKLESS PATTERNING

4,834,834

MATCHED FILTERS

4,016,412; 4,055,758; 4,075,706

MATERIAL DEPOSIT ON SURFACE

4,340,617

MATRIX PRODUCT NETWORK

4,464,726

MECHANICAL FORCE

3,887,937; 4,011,745

MELT GROWTH

3,625,660

MEMBRANES

3,742,230

MEMORY CORE

2,736,880; 4,426,712

MEMORY SYSTEM

3,515,606

MERCURY CADMIUM TELLURIDE

4,642,142

MERCURY VAPOR

4,642,142

MESA DEVICE

4,468,850; 4,777,148

MESFET PROCESSING

4,774,205

SUBJECT INDEX

MESOPHASE

4,256,787; 4,370,194

METAL

3,382,161

METAL FILMS

3,497,698; 4,756,927

METAL INSULATOR SEMICONDUCTOR

3,746,867

METAL INSULATOR SEMICONDUCTOR

RADIATION DETECTOR

3,497,698

METAL NITRIDE OXIDES

4,291,390

METAL NITRIDE OXIDES STORAGE

ELEMENT

4,291,390

METAL OXYHALIDES

4,868,005

METALLIZATION

4,372,996

MICRO-ACOUSTIC WAVEGUIDE

3,789,327

MICROCHANNEL HEAT SINKS

4,881,237

MICROFABRICATION

4,619,894

MICROLASER

4,860,304

MICROLENS

4,813,762

MICROMETER

3,912,394

MICROWAVE APPLICATIONS

4,947,143

MILLIMETER WAVE FREQUENCY

4,947,143

MIRROR SURFACE

4,784,722; 4,894,840

MIRRORS

3,912,394; 4,718,070; 4,721,349;

4,822,120

MIXERS

4,525,871

MNOS

4,313,178

MNOS CHIPS

4,652,926

MNOS STORAGE ELEMENT

4,313,178

MODULATED SIGNAL

4,893,352

MODULATION TRANSFER FUNCTIONS

3,912,394

MODULATORS

4,166,669

MOLECULAR BEAM EPITAXY

4,746,620

MOLECULAR DOPANT

4,220,510

MOLECULAR LIQUIDS

4,107,544

MOLYBDENUM OVER CERMET

4,672,254

MONOLITHIC GALLIUM

ARSENIDE/SILICON MOSFETS

4,774,205

MONOLITHIC INTEGRATION

4,774,205

MONOLITHIC MIXERS

4,553,265

MOS

3,863,070

SUBJECT INDEX

MOSFETS	NEAR ECHO
3,863,070; 4,700,461	4,742,510
MOTION ESTIMATE	NICKEL
4,838,685	4,372,996
MOTION PICTURES	NICKEL ALLOYS
4,838,685	4,372,996
MOVING ENERGY BEAM	NICKEL LAYER
4,309,225	4,150,177
MULTIDIMENSIONAL DATA	NIOBIUM
PROCESSING	4,499,441
4,313,159	NONCENTROSYMMETRIC MATERIAL
MULTIELEMENT TRANSMISSION LINE	3,887,937; 4,011,745
3,289,110	NONCOLLINEAR PHASED-MATCHED
MULTILAYER COMPOSITE	4,063,105
4,556,277	NONDESTRUCTIVE READ-OUT CIRCUIT
MULTILAYER DIELECTRIC OPTICAL	3,488,644
NETWORK	NONLINEAR CONVERSION
3,393,957	4,107,544
MULTILAYER INTEGRATED CIRCUITS	NONLINEAR MEDIUM
4,843,034	4,063,105
MULTILAYER METAL STRUCTURES	NONRECIPROCAL TRANSMISSION
4,585,490	DEVICE
MULTILEVEL OPTICAL ELEMENTS	3,289,110
4,895,790	NONVACUUM SOFT X-RAY
MULTIPLE-FREQUENCY LASER	4,119,855
3,676,795	
MULTIPOINT JUNCTIONS	OHMIC CONTACT
3,304,519	3,077,578
MULTIPOINT POWER	OMNIDIRECTIONAL ANTENNA PATTERN
DIVIDER-COMBINER	4,959,653
4,947,143	
	OPTICAL AXIS
NARROW BASE JUNCTION DIODE	4,479,224
2,975,342	OPTICAL COMPRESSION
NAVIGATIONAL POSITION RECEIVER	3,720,884
4,426,712	OPTICAL ELEMENTS
	4,895,790

SUBJECT INDEX

OPTICAL FOCAL DISTANCE
3,619,067

OPTICAL GAIN ELEMENTS
4,479,224

OPTICAL GAP MEASURING
4,618,261

OPTICAL GUIDED WAVE DEVICES
4,420,873; 4,518,219

OPTICAL HETERODYNE
COMMUNICATIONS SYSTEMS
4,893,352

OPTICAL IMAGING
4,652,926

OPTICAL IMAGING DETECTOR
4,791,490

OPTICAL INTERROGATION
3,500,354

OPTICAL MATERIALS
4,734,152

OPTICAL MIXING
4,063,105

OPTICAL PUMPING
4,860,304

OPTICAL RADIATION
4,063,105

OPTICAL SIGNAL
4,382,660; 4,798,437

OPTICAL SURFACES
4,323,422

OPTICAL TRANSISTORS
4,382,660

OPTICAL TRANSMITTER
4,893,352

OPTICAL WAVEFRONTS
4,798,437

OPTICAL WAVEGUIDES
4,166,669; 4,420,873; 4,468,850;
4,518,219

OPTICALLY FLAT DAMAGE-FREE
SURFACES
4,323,422

OPTICALLY PUMPED SEMICONDUCTOR
LASER
3,568,087

OPTOELECTRONIC APPARATUS
3,871,215

OPTOELECTRONIC MIXERS
4,525,871

OPTOELECTRONIC SWITCH
4,376,285

OPTOELECTRONICS
3,897,766

ORBITS
3,521,835

ORDERED LIQUIDS
4,256,787; 4,370,194

ORGANOMETALLIC CHEMICAL VAPOR
DEPOSITION
4,839,145

ORTHOGONAL OPTICAL SIGNAL
4,893,352

OXIDES
4,184,172; 4,231,819

P-I-N PHOTODETECTORS
4,746,620

P-N JUNCTIONS
4,320,247

P-TYPE SILICON SUBSTRATE
4,864,378

SUBJECT INDEX

- PACKAGING
4,027,383
- PALLADIUM
4,150,177
- PARTICLES
4,038,216; 4,115,228
- PASSIVATING IMPERFECTIONS
4,197,141
- PATTERNED FILMS
4,608,117; 4,615,904; 4,668,528
- PELTIER EFFECT
3,879,235
- PERIODIC GRATING STRUCTURE
4,777,148
- PERIODIC PATTERNS
4,200,395; 4,340,305; 4,649,351
- PERMALLOY FILM
3,515,606
- PERMEABLE BASED TRANSISTOR
4,378,629
- PERTURBATIONS
4,268,808; 4,342,970
- PHASE DISPERSION
4,856,068
- PHASE ERROR
3,883,831
- PHASE LOCK LOSS DETECTOR
4,473,805
- PHASE MODULATION
3,720,884
- PHASE SHIFTERS
3,304,519
- PHOTODEPOSITION
4,668,528; 4,748,045; 4,868,005
- PHOTODETECTORS
3,746,867; 4,547,622
- PHOTODIODES
3,497,698
- PHOTODISSOCIATION
4,608,117; 4,615,904
- PHOTOEMISSIVE SURFACE
3,950,645
- PHOTOFORMED PLATED
INTERCONNECTION
3,965,277
- PHOTOLITHOGRAPHIC MASKS
4,672,254
- PHOTOLITHOGRAPHIC TECHNIQUES
4,718,070
- PHOTOLYSIS
4,340,617; 4,608,117; 4,615,904;
4,868,005
- PHOTOREFRACTIVE BEAMSTEERING
4,508,431
- PHOTORESISTIVE EFFECT
3,863,070
- PHOTOVOLTAIC CELLS
4,444,992
- PHOTOVOLTAIC-THERMAL COLLECTORS
4,444,992
- PIEZOELECTRIC SUBSTRATES
4,672,254
- PIEZOELECTRICS
4,016,412; 4,055,758; 4,066,984;
4,075,706; 4,101,965
- PITCH DETECTION
4,710,959
- PITCH DETECTOR
3,395,345; 4,710,959

SUBJECT INDEX

- PLANAR DIODES
2,975,342
- PLANAR OPTICAL WAVEGUIDE
4,166,669
- PLANAR PROCESS
4,256,787; 4,370,194
- PLASMA DEPOSITION TECHNIQUE
4,614,628
- PLASMA FLOW
3,625,660
- PLASMA TORCH
3,324,334
- PLATE ALIGNMENT
4,340,305
- PLATELETS
4,140,369
- PLATES
4,200,395; 4,490,445
- PLATING BATH
4,372,996
- PLATINUM SILICIDE SCHOTTKY-
BARRIER DETECTOR
4,864,378
- PLURALITY OF LASER BEAMS
4,649,351
- POLARIZATION
2,978,704
- POLLUTANT DETECTION
3,871,215; 3,897,766
- POLLUTION
3,897,766
- POLLUTION CONTROL
3,871,215; 3,897,766; 4,644,751
- POLYCRYSTALLINE
4,366,338; 4,371,421
- POLYCRYSTALLINE SEMICONDUCTORS
4,670,088
- POLYCRYSTALLINE SILICON
4,184,172; 4,231,819; 4,283,235
- POLYESTER RESIN
4,150,177
- POLYESTERS
3,965,277
- POLYIMIDE
4,756,927
- POLYIMIDE MEMBRANE MASKS
4,170,512; 4,254,174; 4,287,235
- POLYMERIC SUBSTRATES
4,248,687
- POLYMERIZATION
4,150,177
- POLYMERS
3,974,382
- POWER CIRCUIT APPLICATIONS
4,700,461
- POWER COMBINING
4,947,143
- POWER DIVIDER-COMBINER
4,947,143
- POWER DIVIDERS
4,947,143
- POWER EFFICIENCY
4,514,581
- POWER PLANTS
4,087,976
- PRENUCLEATION
4,608,117; 4,615,904
- PRIME MOVER
3,871,215; 3,897,766

SUBJECT INDEX

PROGRAMMABLE TRANSVERSAL

FILTER

4,298,953

PROPAGATION

3,789,327; 3,883,831

PROPELLED VEHICLES

3,768,417; 3,842,751; 3,871,301

PULLING MECHANISM

4,662,860

PULSE POWER

3,818,243

PULSE POWERED CIRCUITS

3,818,243

PULSE TONE WAVEFORM

4,690,551

PULSE-MODULATED SIGNAL

3,871,215

PULSED GAS LASER

4,093,927

PULSED LASER RADAR

4,447,149

PULSED LASERS

3,941,670; 4,115,280

PUNCH-THRU DIODE

2,975,342

Q-SWITCH

3,941,670; 4,115,280

Q-SWITCHED LASER

4,447,149

QUADRATURE COMPONENTS

4,794,556

QUANTUM MECHANICS

3,863,070

RADIATION

3,568,087; 3,590,248; 3,649,838;

3,927,385

RADIATION HARDENING

4,700,461

RADIATION RESPONSIVE SIGNAL

STORAGE DEVICE

3,746,867

RADOME STRUCTURAL DEVICES

2,978,704

RANDOM DISTURBANCES

2,982,852

REACTOR

4,087,976

REACTORS

4,839,145

READ-OUT RADIATION

3,746,867

RECEIVERS

2,982,853

RECTANGULAR WAVEGUIDES

4,558,290

REDUNDANT CIRCUITS

3,818,243

REFLECTANCE PATTERN

4,274,737

REFLECTIONS

3,883,831

REFLECTIVE GRATING

4,410,237

REFLECTIVITY

4,511,216

REFLECTORS

3,568,087; 4,376,228; 4,479,224;

4,514,581

SUBJECT INDEX

- REFRACTIVE INDEX
4,140,369
- REFRACTORY METAL DEPOSITION
4,756,927
- RESONANT CAVITY
3,676,795
- RESONANT TUNNELING DEVICE
4,831,340
- RETROREFLECTORS
3,619,067
- RIBBON ARRAYS
4,027,383
- RINGS
4,268,095
- ROCKET RESPONSE
3,521,835
- SAMPLING IN-PHASE AND
QUADRATURE COMPONENTS
4,794,556
- SATELLITE CODE
4,426,712
- SAWTOOTH PATTERNS
4,274,737
- SCANNING BEAMS
4,652,926
- SCHOTTKY BARRIER INFRARED
DETECTOR
4,864,378
- SCHOTTKY DIODE
4,066,984; 4,101,965
- SECONDARY-ELECTRON EMITTERS
4,038,216; 4,115,228
- SEED-SOLUTION SYSTEM
4,186,045
- SEEDED SOLIDIFICATION
4,357,183; 4,371,421; 4,670,088
- SELECTION SYSTEM
3,281,802
- SELECTIVE OXIDATION
4,283,235
- SELECTIVE-BLACK ABSORBER
4,312,915; 4,442,166
- SELF-ALIGNED MASK
4,700,461
- SEMI-INSULATING
4,376,285
- SEMICONDUCTING ALLOYS
3,748,593; 3,794,844
- SEMICONDUCTOR DEVICES
3,649,838; 3,676,795; 3,871,017;
3,887,937; 4,011,745; 4,248,675;
4,636,404; 4,745,452; 4,839,310
- SEMICONDUCTOR DIODE LASERS
4,881,237
- SEMICONDUCTOR EMBEDDED LAYER
TECHNOLOGY
4,378,629
- SEMICONDUCTOR FILMS
4,059,461; 4,853,076; 4,889,583
- SEMICONDUCTOR GROWTH
4,632,712
- SEMICONDUCTOR LASERS
3,568,087; 3,590,248; 4,479,224;
4,718,070; 4,784,722; 4,894,840
- SEMICONDUCTOR MASKING
4,619,894
- SEMICONDUCTOR MATERIALS
3,748,593; 3,794,844; 3,886,530;
4,186,045; 4,197,141; 4,227,941;
4,366,338; 4,727,047; 4,837,182;
4,839,145

SUBJECT INDEX

SEMICONDUCTOR REGROWTH

4,903,089

SEMICONDUCTOR SENSOR

3,887,937; 4,011,745

SEMICONDUCTOR SPATIAL LIGHT MODULATOR

4,848,880; 4,865,427

SEMICONDUCTOR SWITCHING MATRIX

3,077,578

SEMICONDUCTOR-INSULATOR STRUCTURE

3,497,698; 4,420,873; 4,518,219

SEMICONDUCTORS

2,990,259; 3,167,663; 3,497,698;
3,636,471; 3,655,986; 4,016,412;
4,055,758; 4,066,984; 4,075,706;
4,101,965; 4,340,617; 4,376,228;
4,376,285; 4,444,992; 4,514,581;
4,632,712

SENSORS

3,871,301

SHADOWING

4,287,235

SHALLOW-HOMOJUNCTION CELLS

4,227,941

SIGNAL COMPRESSION

3,518,578

SIGNAL DETECTION

3,395,345

SIGNAL EXPANSION

3,518,578

SIGNAL PROCESSING

4,016,412; 4,055,758; 4,066,984;
4,075,706; 4,101,965; 4,464,726;
4,499,441; 4,609,890

SIGNAL PROCESSING INTERFACE

4,710,959

SIGNAL STORAGE DEVICE

3,886,530

SIGNAL-IN-NOISE

4,066,984

SIGNAL-TO-NOISE RATIO

3,566,383

SIGNALS

2,982,852; 3,425,051; 3,488,644;
3,521,835; 4,256,787; 4,298,280;
4,313,178; 4,370,194; 4,426,712;
4,458,324; 4,473,805

SILICON

4,184,172; 4,231,819; 4,479,846

SILICON AND GALLIUM ARSENIDE DEVICES

4,774,205

SILICON CRYSTAL

4,320,247

SILICON DIOXIDE

3,863,070; 4,479,846

SILICON MOSFETS

4,774,205

SILICON SOLAR CELL

4,501,966

SILICON-ON-INSULATOR

4,889,583

SILVER

4,556,277

SINE WAVE

4,885,790

SINE-WAVE SYNTHESIS

4,937,873

SINGLE SIDEBAND

4,553,265

SINGLE-CRYSTAL FURNACES

2,990,259

SUBJECT INDEX

SOFT X-RAY LITHOGRAPHY

3,743,842

SOFT X-RAY MASK

3,742,229; 3,742,230; 3,974,382;

3,984,680; 4,119,855; 4,170,512;

4,254,174; 4,360,586

SOLAR CELLS

4,227,941; 4,248,675; 4,320,247;

4,376,228; 4,444,992; 4,514,581;

4,547,622; 4,816,420; 4,853,076

SOLAR ENERGY

4,087,976; 4,337,990; 4,454,371;

4,556,277; 4,721,349; 4,822,120

SOLAR ENERGY ABSORBER

4,312,915; 4,442,166

SOLAR ENERGY CONCENTRATOR SYSTEM

4,454,371

SOLAR TRANSMISSION

4,721,349; 4,822,120

SOLENOIDS

2,994,808

SOLID ELECTROLYTES

4,614,628

SOLID MATERIAL

3,625,660

SOLID OXIDE

4,490,445; 4,614,628

SOLID OXIDE ELECTROCHEMICAL ENERGY CONVERTER

4,490,445

SOLID SOLUTIONS

3,748,593; 3,794,844

SOLID STATE CAMERA

4,652,926

SOLID STATE DEVICES

3,886,530; 4,290,118; 4,652,926;

4,727,047; 4,837,182

SOLID STATE LASER

4,860,304

SOLID STATE MICROLASER

4,860,304

SOLID-MELT INTERFACE

3,879,235

SOLID-TRANSFORMATION RESIST

4,619,894

SOLUTION-SUBSTRATION SYSTEM

3,879,235

SPARK PLUG

3,974,412; 4,087,719

SPATIAL BEHAVIOR CHARACTERISTICS

3,974,412; 4,087,719

SPATIAL CHARACTERISTICS

3,941,670; 4,115,280

SPATIAL FILTER SYSTEM

4,489,390

SPATIAL FILTERING

4,489,390

SPATIAL LIGHT MODULATOR

4,696,533; 4,848,880; 4,865,427

SPATIAL MODULATION

4,848,880

SPATIAL PERIOD DIVISION

4,360,586

SPEECH

4,937,873

SPEECH ANALYZER

4,710,959

SPEECH CODING

4,885,790

SUBJECT INDEX

- SPEECH PROCESSING
4,856,068; 4,885,790
- SPEECH TRANSMISSION
4,856,068
- SPLIT WAVEGUIDE
4,893,352
- SPUTTERING
4,038,216; 4,115,228
- STABILIZATION
3,871,301
- STEAM PLANT
4,644,751
- STORAGE
3,281,802; 4,075,706; 4,290,118
- STORAGE SHIFT REGISTER ARRAY
4,313,159
- STORAGE/ACCESS SHIFT REGISTER
ARRAY
4,313,159
- STRESSES
3,676,795; 3,871,017
- SUBMILLIMETER SOURCES
3,869,618
- SUBSTRATE LEAKAGE CURRENT
4,839,310
- SUBSTRATE MATERIAL
4,312,915; 4,371,421; 4,442,166
- SUBSTRATES
3,742,229; 3,743,842; 3,974,382;
3,984,680; 4,016,412; 4,038,216;
4,055,758; 4,066,984; 4,075,706;
4,101,965; 4,119,855; 4,127,900;
4,170,512; 4,227,941; 4,242,736;
4,256,787; 4,290,118; 4,340,617;
4,370,194; 4,376,285; 4,384,299;
4,479,846; 4,668,528; 4,756,927
- SUM-DIFFERENCE FREQUENCY
OPTICAL MIXING
4,063,105
- SUPERCONDUCTING ELECTROMAGNET
3,200,299
- SUPERCONDUCTIVE CIRCUITS
4,499,441
- SUPERCONDUCTIVITY
3,011,711; 3,200,299
- SUPPORTED MEMBRANE COMPOSITE
STRUCTURE
4,254,174
- SURFACE ACOUSTIC WAVE DEVICES
4,016,412; 4,066,984; 4,075,706;
4,101,965; 4,268,808; 4,290,118;
4,291,390; 4,313,178; 4,342,970;
4,609,890; 4,672,254
- SURFACE DEPOSITION
4,340,617; 4,748,045
- SURFACE EMITTING DIODE LASER
4,718,070; 4,722,092; 4,784,722;
4,894,840
- SURFACE HALOGENATION
4,834,834
- SURFACE WAVE DEVICE
3,883,831; 4,016,412; 4,055,758;
4,066,984; 4,075,706; 4,101,965;
4,268,808; 4,290,118; 4,291,390;
4,313,178; 4,342,970
- SURFACES
4,340,617; 4,444,992
- SUSPENDED VEHICLES
3,871,301
- SWITCHED STATE
3,488,644

SUBJECT INDEX

SWITCHES 4,166,669	THERMAL MODULATOR 3,516,080
SWITCHING 2,975,342	THERMAL PLASMA 3,324,334
SYMMETRY 3,010,031	THERMAL RESIST 4,619,894
SYNCHRONOUS MOTOR 3,871,301	THERMAL STRESSES 4,853,076
SYNCHRONOUS SATELLITES 3,521,835	THIN ACTIVE LAYER 4,514,581
SYRINGE-TYPE FURNACES 2,990,259	THIN FILM MEMORY SYSTEM 3,495,224
TANDEM SOLAR CELLS 4,816,420	THIN FILMS 3,515,606; 4,479,846; 4,748,045; 4,853,076
TARGET SIGNALS 4,959,653	THIN SOLID FILMS 4,333,792
TARGETS 4,298,280	THREE-DIMENSIONAL OPTICAL IMAGING 4,791,490
TELESCOPING LOW VIBRATION PULLING MECHANISM 4,662,860	TIME-VARYING COMPONENTS 4,298,953
TENSILE STRESS 4,853,076	TITANIUM DIOXIDE 4,556,277
TERAHERTZ FREQUENCY 4,745,452	TORQUE 3,871,215; 3,897,766
TEST METHODS 4,274,737	TRANSFORMERS 3,448,421
TEST PATTERNS 4,274,737	TRANSISTOR CIRCUITS 3,010,031
THERMAL COLLECTORS 4,444,992	TRANSISTORS 3,425,051; 4,067,037; 4,184,172; 4,231,819; 4,839,310
THERMAL CYCLING 4,632,712	TRANSITION METAL OXIDE CRYSTALS 3,382,161

SUBJECT INDEX

- TRANSMISSION LINES
3,289,110; 4,093,927; 4,499,441
- TRANSMISSIVE FACET
4,479,224
- TRANSMIT PULSES
4,298,280
- TRANSMITTERS
3,743,842
- TRANSMITTING SHAFT
3,871,215; 3,897,766
- TRANSPARENT HEAT MIRRORS
4,248,687; 4,337,990; 4,721,349;
4,822,120
- TRANSPORT FURNACE
3,626,154
- TRANSPORTATION
3,768,417; 3,842,751
- TRANSVERSAL FILTER
4,499,441
- TRANSVERSE ELECTROMAGNETIC
MODE
3,289,110
- TUNABLE COHERENT RADIATION
4,063,105
- TUNNELING
4,745,452
- TUNNELING TRANSFER DEVICES
4,745,452
- TWO-DIMENSIONAL SURFACE-
EMITTING DIODE LASER ARRAYS
4,881,237
- ULTRATHIN
4,514,581
- ULTRATHIN ACTIVE LAYERS
4,376,228
- ULTRAVIOLET IRRADIATION
3,965,277
- ULTRAVIOLET LITHOGRAPHY
4,895,790
- UNDERGROUND STRUCTURES
3,831,173
- VACUUM
3,515,606
- VACUUM CLEANING NOZZLE
3,963,515
- VAPOR DEPOSITION
4,868,005
- VARIABLE COUPLER
4,166,669
- VARIABLE VOLTAGE RAMP
4,127,900
- VEHICLES
3,768,417; 3,842,751
- VELOCITY ESTIMATION
4,838,685
- VERNIER PATTERN
4,274,737
- VERTICAL FIELD EFFECT TRANSISTORS
4,903,089
- VERTICAL TRANSISTOR DEVICE
4,903,089
- VISIBLE LASERS
4,868,005
- VISIBLE LIGHT LASER
4,868,005
- VISIBLE-LASER DEPOSITION
4,748,045
- VLSI
4,636,404

SUBJECT INDEX

VLSI CIRCUITS

4,718,070

VOCODER

4,710,959

VOICE ENCODER

4,710,959

VOICE SYNTHESIZER

4,710,959; 4,710,959

VOLATILE CONSTITUENTS

2,990,259

VOLTAGE

3,974,382; 4,242,736; 4,384,299

VOLTAGE TUNABLE INFRARED

DETECTOR

3,863,070

WAFERS

3,950,645; 4,563,765

WAVEFORM RECONSTRUCTION

4,937,873

WAVEFRONT COMPENSATION

4,798,437

WAVEGUIDES

4,166,669

WIRE MOSAIC

3,950,645

X-RAY LITHOGRAPHY

3,742,229; 3,743,842; 3,984,680;
4,119,855; 4,287,235

X-RAY MASK

3,720,884; 3,742,230; 3,974,382;
3,984,680; 4,287,235

X-Y TRANSLATOR

4,501,966

XOR GATES

4,473,805

ZERO BIAS

4,298,953

ZINC

4,372,996

ZONE-MELTING RECRYSTALLIZATION

4,889,583

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE		3. REPORT TYPE AND DATES COVERED	
4. TITLE AND SUBTITLE Bibliography of Patents and Licenses 1951-1990 1991 Edition				5. FUNDING NUMBERS C — F19628-90-C-0002	
6. AUTHOR(S) Comp. and ed. by Robert G. Hall Jean E. King Mary L. Murphy					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Lincoln Laboratory, MIT P.O. Box 73 Lexington, MA 02173-9108				8. PERFORMING ORGANIZATION REPORT NUMBER 17-1015	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) HQ Electronic Systems Command ESC/ENKL Hanscom AFB, MA 01730-5000				10. SPONSORING/MONITORING AGENCY REPORT NUMBER ESC-TR-94-101	
11. SUPPLEMENTARY NOTES None					
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) <p>Since its establishment in 1951, MIT Lincoln Laboratory has actively pursued its mission to "Carry out a program of research and development pertinent to national defense with particular emphasis on advanced electronics." Toward this end, the Laboratory promotes scientific and technological research providing the best solutions to address the needs of the nation. By patenting and licensing inventions, technology originally developed to meet the specific needs of the Department of Defense and other government agencies can be applied to solve problems in the civilian sector; this substantially benefits the nation's economy and serves as an impetus for improving society worldwide.</p>					
14. SUBJECT TERMS patents inventors x-ray lithography solid state laser licenses computers graphoeptitaxy parallel processing network technology transfer semiconductors bifocal lens optical modulators inventions				15. NUMBER OF PAGES 86	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Unclassified		